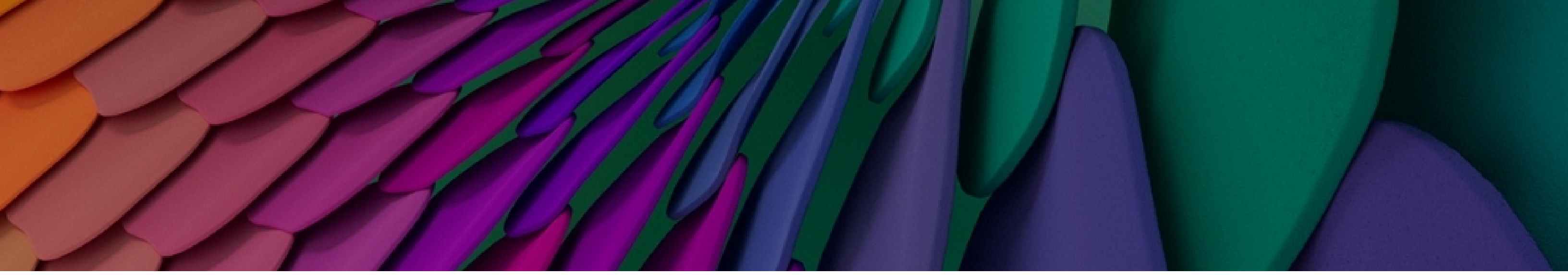

AOS-CX 10.14 Command-Line Interface Guide

6300, 6400 Switch Series

aruba

a Hewlett Packard
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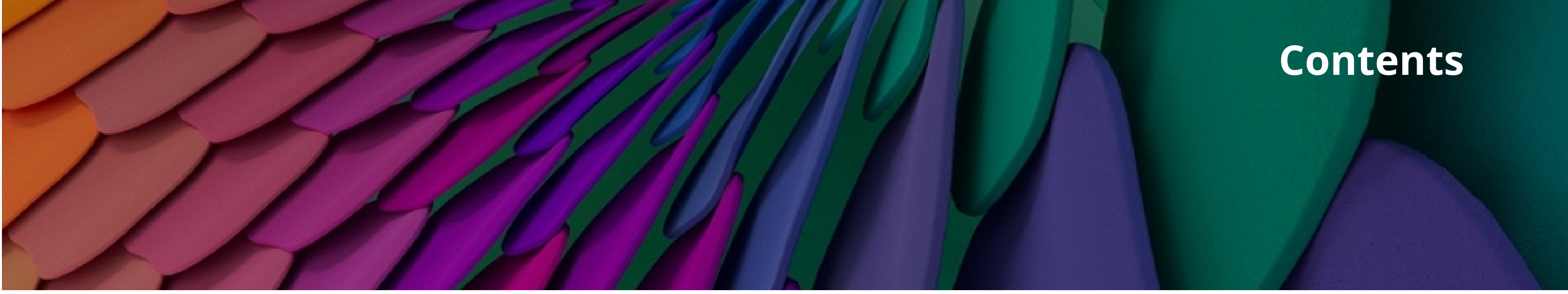

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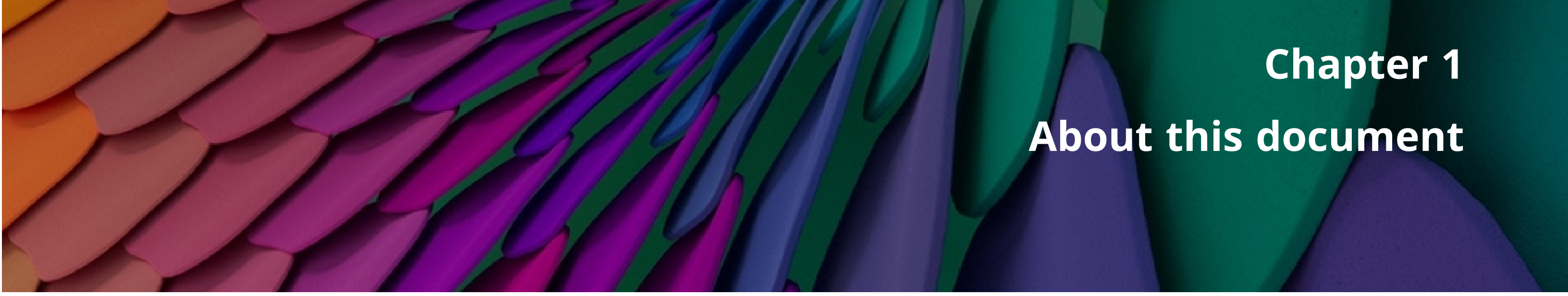


Chapter 1

About this document

This document describes features of the AOS-CX network operating system. It is intended for administrators responsible for installing, configuring, and managing Aruba switches on a network.

Applicable products

This document applies to the following products:

- HPE Aruba Networking 6300 Switch Series (JL658A, JL659A, JL660A, JL661A, JL662A, JL663A, JL664A, JL665A, JL666A, JL667A, JL668A, JL762A, R8S89A, R8S90A, R8S91A, R8S92A, S0E91A, S0X44A)
- HPE Aruba Networking 6400 Switch Series (R0X31A, R0X38B, R0X38C, R0X39B, R0X39C, R0X40B, R0X40C, R0X41A, R0X41C, R0X42A, R0X42C, R0X43A, R0X43C, R0X44A, R0X44C, R0X45A, R0X45C, R0X26A, R0X27A, JL741A, S0E48A,S0E48A #0D1, S1T83A, S1T83A #0D1)

What's new in this release

Commands introduced or modified in 10.14.0001

Command	Description
actions (NAE-lite)	Existing command with new **Schedule** and **Trap** actions introduced.
arp ip	Replaced the **ipv4** parameter with the **ip** parameter. The**i pv4** parameter is deprecated.
arp ip mac	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
class gbp-ip	The **app-category** parameter is introduced to support application-based roles for IPv4 networks.
class gbp-ipv6	The **app-category** parameter is introduced to support application-based roles for IPv6 networks.
clear arp	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
clear dhcp-snooping binding	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
collect egress-vlan	New command that configures collect (non-key) fields for a flow record when in the **config-flow-record** context.
collect forwarding-status	New command that configures collect (non-key) fields for a flow record when in the **config-flow-record** context.
dhcp-snooping ...	The **dhcpv4-snooping**, **show dhcpv4-snooping**, and **clear dhcpv4-**

Command	Description
show dhcp-snooping ... clear dhcp-snooping ...	**snooping** series of commands are deprecated, and are replaced with **dhcp-snooping**, **show dhcp-snooping** and **clear dhcp-snooping** commands with similarsyntax and functionality.
eapol-eth-type	New command that configures the Ether-Type for use in frames for MKA.
erase feature-pack	The **reset** parameter is introduced, Running the **erase feature-pack reset** command will disable all subscription features and stop honor mode warnings.
fib-optimization evpn-vxlan host-route	Replaced the **ipv4** parameter with the **ip** parameter. Th e**ipv4** parameter is deprecated.
flow-tracking	The **track icmp** parameter is introduced, enabling tracking of ICMP flows, in addition to the TCP/UDP flows tracked by default.
flow record	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
image-location	The **allow-unsigned** parameter is introduced to allow the download and deployment of an unsigned container image.
interface tunnel	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
ipv4|ipv6 flow monitor	
rate-limit	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
show history	The **all-sessions** parameter is introduced.
show ip pim tree-state	This new command displays upstream join states for a specified group and source address in a VRF.
show ipv6 pim6 tree-state	This new command displays upstream join states for a specified group and source address in a VRF in an IPv6 network.
show running-config container	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
show snmp community	The output of this command now displays an error message when the switch is in SNMPv3-only mode.
show vrrp	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
snmp-server community	Replaced the **ipv4** parameter with the **ip** parameter. Th e**ipv4** parameter is deprecated.
snmp-server host	**Notification-type**is added to SNMP trap receivers. Now, you can select which traps are sent to each trap receiver.
system private-vlan share-hw-resource	In the PVLAN default mode, there is now no limit on the number of secondary ports configured. In this mode, multiple trunk ports configured as secondary ports can share the hardware resources.

Command	Description
transport-protocol	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
vlan protocol	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
vrrp	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.

Command	Description
area (ospf) redistribute clear ip ospf neighbors clear ip ospf statistics show ip ospf border-routers show ip ospf interface show ip ospf lsdb show ip ospf routes show ip ospf statistics show ip ospf statistics interface show ip ospf virtual-links area clear ipv6 ospfv3 neighbors clear ipv6 ospfv3 statistics redistribute reference-bandwidth retransmit-interval router-id show ipv6 ospfv3 show ipv6 ospfv3 border-routers show ipv6 ospfv3 interface show ipv6 ospfv3 neighbors show ipv6 ospfv3 routes show ipv6 ospfv3 statistics show ipv6 ospfv3 statistics interface show ipv6 ospfv3 virtual-links redistribute redistribute redistribute	The supported **<process-ID>** parameter range is expanded from 1-63 to 1-65535.

Latest version available online

Updates to this document can occur after initial publication. For the latest versions of product documentation, see the links provided in Support and Other Resources.

Command syntax notation conventions

Convention	Usage
`example-text`	Identifies commands and their options and operands, code examples, filenames, pathnames, and output displayed in a command window. Items

Convention	Usage
	that appear like the example text in the previous column are to be entered exactly as shown and are required unless enclosed in brackets (**[ ]**).
example-text	In code and screen examples, indicates text entered by a user.
Any of the following: ■ *`<example-text>`* ■ `<example-text>` ■ *`example-text`* ■ *example-text*	Identifies a placeholder—such as a parameter or a variable—that you must substitute with an actual value in a command or in code: ■ For output formats where italic text cannot be displayed, variables are enclosed in angle brackets (**< >**). Substitute the text—including the enclosing angle brackets—with an actual value. ■ For output formats where italic text can be displayed, variables might or might not be enclosed in angle brackets. Substitute the text including the enclosing angle brackets, if any, with an actual value.
|	Vertical bar. A logical **OR** that separates multiple items from which you can choose only one. Any spaces that are on either side of the vertical bar are included for readability and are not a required part of the command syntax.
`{ }`	Braces. Indicates that at least one of the enclosed items is required.
`[ ]`	Brackets. Indicates that the enclosed item or items are optional.
… or `...`	Ellipsis: ■ In code and screen examples, a vertical or horizontal ellipsis indicates an omission of information. ■ In syntax using brackets and braces, an ellipsis indicates items that can be repeated. When an item followed by ellipses is enclosed in brackets, zero or more items can be specified.

About the examples

Examples in this document are representative and might not match your particular switch or environment.

The slot and port numbers in this document are for illustration only and might be unavailable on your switch.

Understanding the CLI prompts

When illustrating the prompts in the command line interface (CLI), this document uses the generic term **switch**, instead of the host name of the switch. For example:

```
switch>
```

The CLI prompt indicates the current command context. For example:

```
switch>
```

Indicates the operator command context.

```
switch#
```

Indicates the manager command context.

switch(*CONTEXT-NAME*)#

Indicates the configuration context for a feature. For example:

```
switch(config-if)#
```

Identifies the **interface** context.

Variable information in CLI prompts

In certain configuration contexts, the prompt may include variable information. For example, when in the VLAN configuration context, a VLAN number appears in the prompt:

```
switch(config-vlan-100)#
```

When referring to this context, this document uses the syntax:

```
switch(config-vlan-<VLAN-ID>)#
```

Where *<VLAN-ID>* is a variable representing the VLAN number.

Identifying switch ports and interfaces

Physical ports on the switch and their corresponding logical software interfaces are identified using the format:

member/slot/port

On the 6300 Switch Series

- *member*: Member number of the switch in a Virtual Switching Framework (VSF) stack. Range: 1 to 10. The primary switch is always member 1. If the switch is not a member of a VSF stack, then member is 1.
- *slot*: Always 1. This is not a modular switch, so there are no slots.
- *port*: Physical number of a port on the switch.

For example, the logical interface **1/1/4** in software is associated with physical port 4 on member 1.

On the 6400 Switch Series

- *member*: Always 1. VSF is not supported on this switch.
- *slot*: Specifies physical location of a module in the switch chassis.
  - Management modules are on the front of the switch in slots 1/1 and 1/2.
  - Line modules are on the front of the switch starting in slot 1/3.
- *port*: Physical number of a port on a line module.

For example, the logical interface **1/3/4** in software is associated with physical port 4 in slot 3 on member 1.

Identifying modular switch components

- Power supplies are on the front of the switch behind the bezel above the management modules. Power supplies are labeled in software in the format: *member/power supply*:
  - *member*: 1.
  - *power supply*: 1 to 4.
- Fans are on the rear of the switch and are labeled in software as: *member/tray/fan*:
  - *member*: 1.
  - *tray*: 1 to 4.
  - *fan*: 1 to 4.

- Fabric modules are not labeled on the switch but are labeled in software in the format: *member/module*:
  - *member*: 1.
  - *member*: 1 or 2.
- The display module on the rear of the switch is not labeled with a member or slot number.

Chapter 2

Introduction to the AOS-CX CLI

CLI access

Access the CLI through the following interfaces:

Console port

Connect the management port on the switch to your computer using a serial cable and then use terminal emulation software to reach the switch from the computer. Typically, the console port is used when first installing the switch and performing initial configuration tasks.

On switches that support active and standby management modules, there is a console port is on each management module. Connect to the console port on the active management module.

Management port (out-of-band connection)

Connect the management port on the switch to your network, and then use SSH client software to reach the switch from a computer connected to the same network. This requires that a DHCP server is installed on the network.

On switches that support active and standby management modules, connect the management port of the active management module to the network.

In the switch factory default state, the management port and SSH on the management VRF (**mgmt**) are enabled.

Data port (in-band connection)

Connect a data port on the switch to your network, and then use SSH client software to reach the switch from a computer connected to the same network. Management traffic ingresses and egresses switch data ports with rest of the traffic on the network, therefore it can be affected by traffic congestion and other issues impacting the network.

Getting CLI help

To show the available commands that you can execute in the current command context, enter the **?** symbol.

For example:

```
switch# ?
  boot            Reboot all or part of the system
  checkpoint      Checkpoint information
switch#
```

The **?** symbol does not display on the screen when you enter it.

The commands that are available to you depend on your authority and the command context. In a given command context, you can only list and execute the commands available in that context.

To show the available parameters for a command, enter the command followed by a space and then enter the **?** symbol.

For example:

```
switch(config)# access-list ?
  all        All access-lists
  ip         Internet Protocol v4 (IPv4)
  ipv6       Internet Protocol v6 (IPv6)
  log-timer  Set ACL log timer length (frequency)
  mac        Ethernet MAC Protocol
switch(config)# access-list
```

After the CLI displays the information, it automatically displays the text you entered before you entered the **?** symbol.

If there is no **<cr>** symbol at the end the command help output, the command is not complete as displayed. You must specify one of the listed parameters.

The **<cr>** symbol alone in the command help output indicates that there are no additional parameters and that you must press the enter key to complete the command. For example:

```
switch# list ?
  <cr>
switch# list
```

The **<cr>** symbol at the end of the command help output indicates that the parameters preceding the **<cr>** are optional and you can enter the command as is displayed. For example:

```
switch# configure ?
  terminal    Configuration terminal (default)
  <cr>
switch# configure
```

To show information about a parameter for a command, enter the command and parameter followed by a space, then enter the **?** symbol.

For example:

```
switch(config)# access-list log-timer ?
  <30-300>  Specify value (in seconds)
  default   Default value (300 seconds)
switch(config)# access-list log-timer
```

Authority levels

In command descriptions, the authority level indicates the user role that is required to execute a command:

Administrators

Users with the role: **administrators**

Users with administrator rights can execute any command.

Operators

Users with the role: **operators**.

Users with operator rights can execute commands in the operator context (**>**) only.

Auditors

Users with the role: **auditors**.

Users with auditor rights can execute commands in the auditor context (**auditor>**) only.

Local user group members with execution rights for a command

You can create up to 29 user-defined local user groups on the switch. Each group can be defined to allow execution of up to 1024 specific CLI commands.

Command contexts

The command context determines the following:

- Which parts of the switch can be managed
- Which commands are available to users with the appropriate authority

Command contexts have a parent-child tree structure in which contexts might themselves contain nested contexts.

Operator context (>)

The operator context enables you to execute commands to view—but not change—the configuration.

The operator context requires the least user privilege to execute commands.

In command descriptions, this context is listed as: Operator (>)

Switch prompt example

switch>

Authority

Operators or Administrators

Showing the available commands in this context

At the command prompt, enter the **?** symbol.

Navigating to the operator context (>)

To navigate to the operator command context (>), do one of the following:

- Log in to the switch CLI with a user ID that has the **operator-group** role.
- From the manager context (#), enter the **disable** command.

Auditor context

When you log in to the switch as user with auditor rights, you have access to the auditor command context only.

Users with auditor rights have access to a limited set of commands. for more information about auditors, see the *Security Guide* for your switch and software version.

Switch prompt example

auditor>

Showing the available commands in this context

At the command prompt, enter the **?** symbol.

Manager context (#)

From the manager context (#), you can execute commands that do not require saving changes to the configuration.

In command descriptions, this context is listed as: Manager (#)

Switch prompt example

switch#

Authority

Administrators or local user group members with execution rights for this command.

Showing the available commands in this context

At the command prompt, enter the **?** symbol.

Access to manager context commands from descendant contexts

The **do** command enables you to access commands from the manager context while you are in a child or descendent context, such as **config** or **config-if**.

For example, to execute the **clear** command from the **config** context, enter the following: **do clear**.

The **show** command can be executed from configuration contexts as well as the manager context, so using the **do** command with the **show** command is deprecated. Support for **do show** might be discontinued in a future software release.

Navigating to the manager context (#)

To navigate to the manager command context (#), do one of the following:

- Log in to the switch CLI with a user ID that has the **administrators** role.
- From the operator context (>), enter the **enable** command.

  You must have administrator authority to enter the **enable** command.

  ```
  switch> enable
  switch#
  ```

- From the configuration context (**config**), enter either the **exit** or the **end** command.

  For example:

  ```
  switch(config)# exit
  switch#
  ```

- From any child or descendent context, enter the **end** command.

  For example:

```
switch(config-vlan-100)# end
switch#
```

Global configuration context (config)

From the global configuration context (**config**), you can execute commands that change the configuration of the switch.

In command descriptions, this context is listed as: **config**

Switch prompt example

switch(config)#

Authority

Administrators or local user group members with execution rights for this command.

Showing the available commands in this context

At the command prompt, enter the **?** symbol.

> You can use the **do** command to execute some manager context commands—such as the **clear** command—from the global configuration context.

Navigating to the config context

To navigate to the **config** command context, do one of the following:

- From the manager context (#), enter the **configure terminal** command:

```
switch# configure terminal
switch(config)#
```

- From a child configuration context, enter the **exit** command.

  For example:

```
switch(config-vlan-100)# exit
switch(config)#
```

Other configuration command contexts

All other configuration command contexts are descendants of the global configuration command context (**config**).

From these command contexts, you can execute commands that apply to that specific context, such as an interface or a VLAN.

Switch prompt examples

- **switch(config-if)#**
- **switch(config-router)#**
- **switch(config-vlan-100)#**

Authority

Administrators or local user group members with execution rights for this command.

Showing the available commands in this context

At the command prompt, enter the **?** symbol.

Support for range contexts

On the 6400 Switch Series, interface identification differs.

Some switch features enable you to use a single command to apply configuration settings to multiple items. You specify the multiple items by creating a type of command context called a **range context**. Then you can execute commands that are applied to every item in the range. For example:

```
switch(config)# interface 1/1/1-1/1/5
switch(config-if-<1/1/1-1/1/5>)# no shutdown
```

You can use a range context to specify multiple items for the following:

Physical interfaces

- Command example: **interface 1/1/1-1/1/8,1/1/10,1/1/12**
- Switch prompt example: **switch(config-if-<1/1/1-1/1/8,1/1/10,1/1/12>)#**

LAG interfaces

- Command example: **interface lag 1-10**
- Switch prompt example: **switch(config-if-lag-<1-10>)#**

Loopback interfaces

- Command example: **interface loopback 1-10**
- Switch prompt example: **switch(config-if-loopback-<1-10>)#**

VLAN interfaces

- Command example: **interface vlan 1,2,3-6**
- Switch prompt example: **switch(config-vlan-if-<1,2,3-6>)#**

VLANs

- Command example: **vlan 1-10,15,20-25**
- Switch prompt example: **switch(config-vlan-<1-10,15,20-25>)#**

Commands entered in a range context are applied to each item in the range individually:

- Each item in the range has its own entry in the output of **show running-config** commands.

  For example, you can configure a range of interfaces as follows:

  ```
  switch(config)# interface 1/1/1-1/1/5
  switch(config-if-<1/1/1-1/1/5>)# no shutdown
  ```

  In the output for the show running-config command, the interfaces are displayed individually:

```
switch(config-if-<1/1/1-1/1/5>)# show running-config
Current configuration:
...
interface 1/1/1
        no shutdown
interface 1/1/2
        no shutdown
interface 1/1/3
        no shutdown
interface 1/1/4
        no shutdown
interface 1/1/5
        no shutdown
...
switch(config-if-<1/1/1-1/1/5>)#
```

- If you specify a range context for interfaces, you cannot execute commands that create a context within the range context. For example, you cannot execute the **vrrp** command from an interface range context, even though you can execute the command from the **config-if** context for a single interface.
- If error is encountered during the execution of a command for an item in the range, the error message returned includes a prefix that identifies the item to which the error applies. However command execution does not stop until the command is attempted on all the items in the range.

  For example, attempting to set an IP address in a range context of loopback interfaces results in the IP address being applied to the first loopback interface in the range, but results in errors for the subsequent interfaces:

```
switch(config)# interface loopback 1-4
switch(config-loopback-if-<1-4>)# ip address 10.1.11.11/24
[loopback2] Overlapping networks observed for "10.1.11.11/24". Please configure
non overlapping networks.
[loopback3] Overlapping networks observed for "10.1.11.11/24". Please configure
non overlapping networks.
[loopback4] Overlapping networks observed for "10.1.11.11/24". Please configure
non overlapping networks.

switch(config-loopback-if-<1-4>)# show running-config | begin 4 "loopback 1"
interface loopback 1
    ip address 10.1.11.11/24
interface loopback 2
interface loopback 3
interface loopback 4
```

- The range context is created only if every item in the range is successfully created or already exists in configuration. If an error occurs during the creation of an item in a range, the items that are created successfully are added to the configuration, but the range context is not created. The switch prompt.

  For example, in the following sequence:

  1. VLANs 1 through 100 are created successfully, so the switch prompt reflects the range of VLANs: **switch(config-vlan-<1-100>)#**
  2. The command **interface vlan 95-105** fails for VLANs 101 through 105, so the range context is not created and the switch prompt remains in the global configuration context: **switch (config)#**
  3. The configuration includes all the VLANs and VLAN interfaces that are created successfully.

```
switch(config)# vlan 1-100
switch(config-vlan-<1-100>)# exit
switch(config)# interface vlan 95-105
VLAN 101 should be created before creating interface VLAN101.
VLAN 102 should be created before creating interface VLAN102.
VLAN 103 should be created before creating interface VLAN103.
VLAN 104 should be created before creating interface VLAN104.
VLAN 105 should be created before creating interface VLAN105.
switch(config)# show running-config
Current configuration:
...
vlan 1-100
interface vlan95
interface vlan96
interface vlan97
interface vlan98
interface vlan99
interface vlan100
...
switch(config)#
```

- If the **no** form of the command can be used to remove an item from the configuration, you can use a range context with the **no** form of the command to remove multiple items from the configuration.

  For example, you can remove VLANs 95 through 100 from the configuration by entering: **no vlan 95-100**

Rules for range contexts

For interfaces that use the ***member/slot/port*** notation, items in the range must be specified in ascending order.

Contiguous items in the range are represented by the smallest and largest values separated by a hyphen.

For example:

Command: **interface 1/1/1-1/1/8**

Switch prompt: **switch(config-if-<1/1/1-1/1/8>)#**

Command: **vlan 1-10**

Switch prompt: **switch(config-vlan-<1-10>)#**

Noncontiguous items in the range must be separated by commas.

For example:

Command: **interface 1/1/1-1/1/8,1/1/10,1/1/12**

Switch prompt: **switch(config-if-<1/1/1-1/1/8,1/1/10,1/1/12>)#**

Command: **vlan 1-10,15,20-25**

Switch prompt: **switch(config-vlan-<1-10,15,20-25>)#**

The switch prompt is truncated to 50 characters.

Command history

You can use the **up arrow** key or **Ctrl+P** to display the previous command in the session history, if any.

You can use the **down arrow** key or **Ctrl+N** to display the next command in the session history, if any.

You can use the **show history** command to show a numbered list of the commands executed during this session. You use the command numbers to specify commands to repeat using the **repeat** command. The **show history** and **repeat** commands are not saved in the history buffer.

The commands saved in the history command buffer are in the same format in which you entered the commands. If you enter an incomplete command, the command saved in the history command buffer is also an incomplete one.

If you execute the same command repeatedly, the switch saves only the earliest record. However, if you execute the same command in different formats, the switch saves them as different commands.

For example, if you execute the **show startup-config** command repeatedly, the system saves only one command in the history command buffer. If you execute the command in the format of **show start** and **show startup** respectively, the system saves them as two commands.

Command completion

The CLI supports both command abbreviation and command completion:

- If you enter enough letters to match a valid command, the CLI accepts the command.

  For example, you can enter **con** instead of **configure** to navigate from the manager context to the global configuration context.

  ```
  switch# con
  switch(config)#
  ```

- If you enter part of a command word and then the press the **Tab** key, one of the following occurs:
  - If you have entered enough letters to match a valid command, the CLI displays the remainder of the word.
  - If you have not entered enough letters to match a valid command, the CLI does not complete the command.

    If you press the **Tab** key a second time, the CLI displays commands that match the letters you entered.

    For example:

    ```
    switch(config)# cl
    class clear clock
    switch(config)# cl
    ```

- If you press the **Tab** key twice after a completed word, the CLI displays the command options.

  For example, if you enter the word **clock** followed by a space and then press the **Tab** key twice, the CLI displays the commands available in that command context that start with that word, and then displays the prompt—including the characters you entered—enabling you to complete the command without retyping.

  ```
  switch(config)# clock
  date       datetime     time   timezone
  switch(config)# clock
  ```

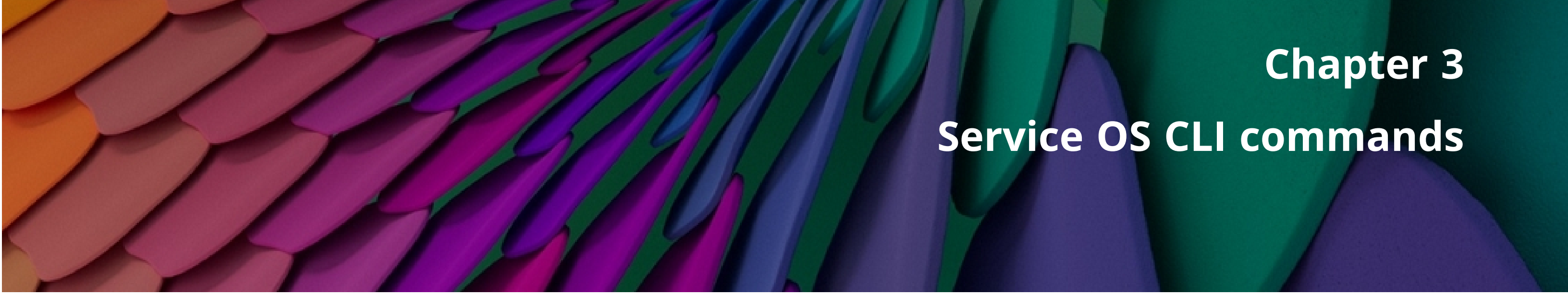
Pipe (|) support in show commands

The pipe (**|**) command is a CLI session command that filters the output of show **show** commands according to the criteria specified by the parameter **include**, **exclude**, **count**, **begin**, or **redirect**.

- The pipe (**|**) command is supported for use with the **show** command only.
- You can use multiple pipe commands with a single show command.
  For example: **show running-config | include "vlan" | exclude "vlan2" | count**
- You can use the pipe command with the **page** command.
- Command completion by pressing the **Tab** key is not supported for pipe commands.

Command syntax notation conventions

Convention	Usage
`example-text`	Identifies commands and their options and operands, code examples, filenames, pathnames, and output displayed in a command window. Items that appear like the example text in the previous column are to be entered exactly as shown and are required unless enclosed in brackets (**[ ]**).
example-text	In code and screen examples, indicates text entered by a user.
Any of the following: ■ *`<example-text>`* ■ `<example-text>` ■ *`example-text`* ■ *example-text*	Identifies a placeholder—such as a parameter or a variable—that you must substitute with an actual value in a command or in code: ■ For output formats where italic text cannot be displayed, variables are enclosed in angle brackets (**< >**). Substitute the text—including the enclosing angle brackets—with an actual value. ■ For output formats where italic text can be displayed, variables might or might not be enclosed in angle brackets. Substitute the text including the enclosing angle brackets, if any, with an actual value.
`|`	Vertical bar. A logical **OR** that separates multiple items from which you can choose only one. Any spaces that are on either side of the vertical bar are included for readability and are not a required part of the command syntax.
`{ }`	Braces. Indicates that at least one of the enclosed items is required.
`[ ]`	Brackets. Indicates that the enclosed item or items are optional.
… or `...`	Ellipsis: ■ In code and screen examples, a vertical or horizontal ellipsis indicates an omission of information. ■ In syntax using brackets and braces, an ellipsis indicates items that can be repeated. When an item followed by ellipses is enclosed in brackets, zero or more items can be specified.



Chapter 3

Service OS CLI commands

boot

`boot`

Description

Presents you with the boot menu prompt. You can then specify which boot profile: primary, secondary, or Service OS console.

Example

Presenting the boot menu prompt:

```
SVOS> boot

ServiceOS Information:
    Version:          FL.01.07.0002-internal
    Build Date:       2020-09-03 10:38:03 PDT
    Build ID:         ServiceOS:FL.01.07.0002-internal:1a017598b673:202009031038
    SHA:              1a017598b6738448ef679175712e022a966eca88

Boot Profiles:

0. Service OS Console
1. Primary Software Image [FL.10.06.0001]
2. Secondary Software Image [FL.10.08.0000-308-gcfbc0e3]

Select profile(primary):
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

cat

`cat <FILENAME/DIRECTORY-NAME>`

Description

Prints the contents of a file to the console. The Service OS does not allow command output redirection, so this command is only useful for reading short text files.

Parameter	Description
<FILENAME/DIRECTORY-NAME>	Shows the contents of the specified file or directory.

Example

Showing the contents of /nos/hosts:

```
SVOS> cat /nos/hosts
127.0.0.1       localhost.localdomain           localhost

SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

cd path

`cd path`

Description

Changes the current working directory.

Example

Changing the current working directory:

```
cd /
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

config-clear

```
config-clear
```

Description

Configures the switch to set all configuration settings to factory default when the switch is restarted. The next time the switch starts, the current **startup-config** is renamed to **startup-config-fixme**, and a new **startup-config** is created with factory default settings.

Using this command is not the same as performing zeroization, which securely erases the entire primary storage and other devices, and not just the configuration.

Example

Configuring the system to clear the switch configuration:

```
SVOS> config-clear

The switch configuration will be cleared.

Continue (y/n)? y
The system has been configured to clear the startup-config on the next
boot. Please execute the 'boot' command to complete this action.
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

cp

```
cp [options] <SOURCE-FILENAME/SOURCE-DIRECTORY> <DESTINATION-FLENAME/DESTINATION-
DIRECTORY>
```

Description

Copies files or directories.

Parameter	Description
`[options]`	Selects the options for the command.
`-d,-P`	Specifies the preservation of symlinks (default if **-R**).
`-a`	Same as **-dpR**.
`R,-r`	Specifies recursiveness, all files, and subdirectories are copied.
`-L`	Specifies the following of all symlinks.
`-H`	Specifies the following of symlinks on command line.
`-p`	Specifies the preservation of file attributes if possible.
`-f`	Specifies the overwriting of a file or directory.
`-i`	Specifies the prompting before an overwrite.
`-l,-s`	Specifies the creation of (sym) links.
`<SOURCE-FILENAME/SOURCE-DIRECTORY>`	Specifies the name of the source file or directory.
`<DESTINATION-FLENAME/DESTINATION-DIRECTORY>`	Specifies the name of the destination file or directory.

Example

Copying /home/customers directory to the /home/clients directory:

```
SVOS> cp /home/customers /home/clients
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

du

`du [options] <FILENAME/DIRECTORY-NAME>...`

Description

Shows estimated disk space used for each file or directory or both.

Parameter	Description
`[options]`	Selects the options for the command.
`-a`	Show file sizes.
`-L`	Shows all symlinks.
`-H`	Shows symlinks on a command line.
`-d, N`	Shows limited output to directories (and files with **-a**) of depth less than **N**.
`-c`	Shows the total disk space usage of all files or directories or both.
`-l`	Shows the count sizes if hard linked.
`-s`	Shows only a total for each argument.
`-x`	Does not show directories on different file systems.
`-h`	Show sizes in human readable format (1K, 243M, and 2G).
`-m`	Show sizes in megabytes.
`-k`	Show sizes in kilobytes (default).
`<FILENAME/DIRECTORY-NAME>`	Specifies the file or directory or both for displaying a size estimate.

Example

Estimating disk space for the /nos directory:

```
SVOS> du -ah /nos
196.4M  /nos/primary.swi
196.4M  /nos
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

erase zeroize

`erase zeroize`

Description

Securely erases any user data contained on the SSD or other storage devices on the management module.

Back up all data before running this command or all user/config data will be lost.

Usage

Use this command to securely erase all customer data and restore the software environment to factory default. When you issue this command:

- Software images are copied to RAM to be restored on completion.
- All bits undergo a 0>1>0 transition to completely zeroize data. This data is not recoverable.
- This feature can be used to remove all configuration settings or system alterations for debugging or troubleshooting.
- The zeroization process takes approximately two minutes.

All logs and data are lost in the zeroization process. Best practices is to collect all applicable data before performing zeroization.

Example

Erasing user data:

~~~
SVOS> SVOS> erase --help
Usage: erase zeroize

Securely erases storage devices on the management module.
SVOS>
```

```
SVOS> erase zeroize
############################WARNING############################
This will securely erase all customer data and reset the switch
to factory defaults. This will initiate a reboot and render the
switch unavailable until the zeroization is complete.
This should take several minutes to one hour to complete.
############################WARNING############################

Continue (y/n)? y
reboot: Restarting system

 ServiceOS Information:
    Version: FL.01.07.0002-internal
    Build Date: 2020-09-02 11:53:34 PDT
    Build ID: ServiceOS:FL.01.07.0002-internal:1a017598b673:202009031038
    SHA: 1a017598b6738448ef679175712e022a966eca88

################ Preparing for zeroization #################

################ Storage zeroization #######################
################ WARNING: DO NOT POWER OFF UNTIL  ##########
################          ZEROIZATION IS COMPLETE ##########
################ This should take several minutes ##########
################ to one hour to complete          ##########

################ Restoring files ###########################
~~~

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

exit

`exit`

Description

Logs the user out from the `svos>` prompt.

Example

Loging the user out from the `svos>` prompt:

```
SVOS> exit

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                      RESTRICTED RIGHTS LEGEND
Confidential computer software. Valid license from Hewlett Packard Enterprise
Development LP required for possession, use or copying. Consistent with FAR
12.211 and 12.212, Commercial Computer Software, Computer Software
Documentation, and Technical Data for Commercial Items are licensed to the
U.S. Government under vendor's standard commercial license.

To reboot without logging in, enter 'reboot' as the login user name.

ServiceOS login:
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

format

`format`

Description

Configures the primary storage device with the correct partition and file system formatting. This command removes all pre-existing data on the primary storage device.

Example

Configuring the primary storage device with the correct partition and file system formatting:

```
SVOS> format
#################WARNING####################
The following action will cause all data on
the primary storage device to be lost. After
formatting has completed, a reboot will be
initiated to complete storage initialization.
#################WARNING####################

Continue? (y/n): y

Working...This may take a few minutes...
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

identify

`identify`

Description

Prints the version and serial number information of hardware devices on the management module (for example, FPGAS, PLDs).

Example

Output from a 6400/6300 switch:

```
SVOS> identify
mc svos_primary           : FL.01.05.0001
mc svos_secondary         : FL.01.05.0001
mc uboot_single           : FL.01.0001
mc uboot_capsule          : FL.01.0001
mc pmc_single             : 0x4
mc pmc_primary            : 0x4
mc pmc_secondary          : 0x4
mc mcb_single             : 0x6
mc mcb_primary            : 0x6
mc mcb_secondary          : 0x6
mc mcb_factory            : 0x3
mc ledpld_single          : 0x4
mc ledpld_primary         : 0x4
mc ledpld_secondary       : 0x4
mc tpm                    : 0x102420E
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

ip

`ip {show | dhcp | disable | addr <`*`ADDR-NETMASK-GATEWAY`*`>}`

Description

Shows or configures the port with a static IP address (IPv4 only) or enables the DHCP client on the port. An address is set only if a DHCP server is available to provide one.

Parameter	Description
`{show	dhcp	disable	addr <`*`ADDR-NETMASK-GATEWAY`*`>}`	Selects the options for the OOBM port.
`show`	Shows the OOBM port.
`dhcp`	Configures the port with a DHCP address.
`disable`	Disables the OOBM port.
`addr <`*`ADDR-NETMASK-GATEWAY`*`>`	Configures the port with a static IP address (IPv4 only). Specify address, netmask, and gateway as A.B.C.D.

Example

Configuring the port with a DHCP IP address:

```
SVOS> ip dhcp
SVOS> ip show
Interface   : Link Up
IP Address  : 10.0.26.17
Subnet Mask: 255.255.252.0
Gateway     : 10.0.24.1

SVOS> ip disable
SVOS> ip show
Interface : Disabled
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

ls

```
ls [<OPTIONS>] [<FILE-NME>]
```

Description

This command lists directory contents.

Parameter	Description
<OPTIONS>	Specifies options for the command.
-1	Shows one-column output.
-a	Shows entries which start with a period (.).
-A	Shows output similar to **-a**, but excludes a period (.) and a double period (..).
-C	Shows output list by columns.
-x	Shows output list by lines.
-d	Shows listing of directory entries instead of contents

Parameter	Description
`-L`	Follows symlinks.
`-H`	Follows symlinks on the command line.
`-R`	Recurse.
`-p`	Appends a slash (/) to directory entries.
`-F`	Appends an indicator to entries. An indicator can be as an asterisk (*) or slash (/) or equal sign (=) or at sign (@) or pipe (|).
`-l`	Shows the output in a long listing format.
`-i`	Shows the list inode numbers.
`-n`	Shows a list of numeric UIDs and GIDs instead of names.
`-s`	Shows a list of allocated blocks.
`-e`	Shows in one column a list with the full date and time.
`-h`	Shows list sizes in human readable format (1K, 243M, 2G) with a one-column output.
`-r`	Shows in one column a sort in reverse order.
`-S`	Shows in one column a sort by size.
`-X`	Shows in the output sort by extension.
`-v`	Shows in one column a sort by version.
`-c`	With **-l**, it shows a sort in one column by **ctime**.
`-t`	With **-l**, it shows a sort by **mtime**.
`-u`	With **-l**, sort by **atime**.
`-c`	With **-l**, it shows a sort in one column by **ctime**
`-w` *<N>*	Assumes that the terminal has the number of columns wide as specified by <*N*>.
`--color[={always | never | auto}]`	Controls color in the output.
<FILE-NAME>	Specifies the name of the file to list.

Example

Listing directory contents:

```
SVOS> ls -la /nos
drwxr-xr-x    3 0        0             4096 Nov 21 03:19 .
drwxr-xr-x   11 0        0              220 Nov 21 03:21 ..
drwx------    2 0        0            16384 Nov 21 03:20 lost+found
```

```
-rwxr-xr-x    1 0         0         205957424 Nov 21 03:19 primary.swi
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

md5sum

`md5sum [-c | -s | -w] [<FILE-NAME>]`

Description

This command computes and checks the MD5 message digest.

Parameter	Description
`[-c	-s	-w]`	Selects the options for the command.
`-c`	Specifies to check the sums against the list in files.
`-s`	Specifies not output anything, status code shows success.
`-w`	Specifies to warn about improperly formatted checksum lines.
`<FILE-NAME>`	Specifies the file name to run the checksum against.

Example

Computing and checking the MD5 message digest for /nos/primary.swi:

```
SVOS> md5sum /nos/primary.swi
93ffc89e7ec357854704d8e450c4b7ab  /nos/primary.swi
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

mkdir

`mkdir [-m | -p] [<DIRECTORY-NAME>]`

Description

This command makes directories.

Parameter	Description
`[-m	-p]`	Specifies the options for the command.
`-m`	Specifies the mode.
`-p`	Specifies to make parent directories as needed with no errors for pre-existing directories.
`<DIRECTORY-NAME>`	Specifies the directory to create.

Example

Making the dir directory:

```
SVOS> mkdir dir
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

mount

`mount <DEVICE>`

Description

This command mounts the SSD partitions to the following locations: **/coredump**, **/logs**, **/nos**, **/selftest**, and mounts the USB device to **/mnt/usb**.

Users can mount USB flash drives formatted as either FAT16 or FAT32 with a single partition.

Parameter	Description
<DEVICE>	Specifies the device to be mounted. Supported device options include `all` and `usb`.

Examples

Mounting all of the SSD   partitions:

```
SVOS> mount all
SVOS> mount usb
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

mv

`mv [-f | -i | -n] <TARGET-DIRECTORY>`

Description

This command moves (renames) files.

Parameter	Description
`-f`	Specifies not to prompt before overwriting.
`-i`	Specifies to prompt before overwriting.
`-n`	Specifies to not overwrite an existing file.

Example

Moving the file named myfile:

```
SVOS> mv myfile
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

password (svos)

`password`

Description

Sets the admin user account password for both Service OS and AOS-CX once the user boots into AOS-CX and saves the configuration. This will overwrite the previous password if one exists. User input is masked with asterisks.

This command is not available if enhanced secure mode is set.

Example

Setting the admin account password:

```
SVOS> password
Enter password:********
Confirm password:********
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

ping

`ping <HOST-IP-ADDRESS>`

Description

Pings network hosts for debug purposes.

Parameter	Description
<HOST-IP-ADDRESS>	Specifies the host IP address.

Example

Pinging a network host:

```
SVOS> ping 10.0.8.10
PING 10.0.8.10 (10.0.8.10): 56 data bytes
64 bytes from 10.0.8.10: seq=0 ttl=63 time=3.496 ms
64 bytes from 10.0.8.10: seq=1 ttl=63 time=0.367 ms
64 bytes from 10.0.8.10: seq=2 ttl=63 time=0.380 ms
64 bytes from 10.0.8.10: seq=3 ttl=63 time=0.282 ms
64 bytes from 10.0.8.10: seq=4 ttl=63 time=0.669 ms
^C
--- 10.0.8.10 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.282/1.038/3.496 ms
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

pwd

`pwd`

Description

Displays the current working directory.

Example

Displaying the current working directory:

```
SVOS> pwd
/home
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

reboot

`reboot`

Description

Reboots the Management Module.

Example

Rebooting the management module:

```
SVOS> reboot
reboot: Restarting system
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

rm

`rm [-f | -i | -R | -r] <FILE-NAME>`

Description

Removes files or directories.

Parameter	Description
`[-f	-i	-R	-r]`	Selects the options for removing files or directories.
`-f`	Never prompt before removing files or directories.
`-i`	Always prompt before removing files or directories.
`-R	-r`	Recursive.

Example

Removing the file named **foo**:

```
SVOS> rm foo
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

rmdir

`rmdir [-p] <DIRECTORY-NAME>`

Description

Removes empty directories.

Parameter	Description
`-p`	Specifies to remove parent directories.

Example

Removing the empty **foo** directory:

```
SVOS> rmdir foo
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

secure-mode

```
secure-mode <enhanced | standard | status>
```

Description

Sets the secure mode to enhanced or standard secure mode. Also can display the current secure mode. A zeroization is required before switching between enhanced and standard secure modes.

The command also displays a message notifying the user that they are already in the targeted secure mode.

Example

Setting the secure mode to enhanced or standard:

~~~
SVOS> secure-mode --help
Usage: secure-mode <enhanced | standard | status>

Set or retrieve the secure mode setting. Requires a zeroization to change modes.
SVOS>
```

```
SVOS> secure-mode enhanced
############################WARNING############################
This will set the switch into enhanced secure mode.  Before
enhanced secure mode is enabled, the switch must securely erase
all customer data and reset the switch to factory defaults.
This will initiate a reboot and render the switch unavailable
until the zeroization is complete.
This should take several minutes to one hour to complete.
############################WARNING############################

Continue (y/n)? y
reboot: Restarting system

```

```
SVOS> secure-mode standard
############################WARNING############################
This will set the switch into standard secure mode.  Before
standard secure mode is enabled, the switch must securely erase
all customer data and reset the switch to factory defaults.
This will initiate a reboot and render the switch unavailable
until the zeroization is complete.
This should take several minutes to one hour to complete.
############################WARNING############################

Continue (y/n)? y
reboot: Restarting system

```

```
SVOS> secure-mode standard
############################WARNING############################
Secure mode is already set to standard.  Setting it again will
repeat the zeroization process.  The switch must securely erase
all customer data and reset the switch to factory defaults.
This will initiate a reboot and render the switch unavailable
until the zeroization is complete.
This should take several minutes to one hour to complete.
############################WARNING############################
~~~

~~~
Continue (y/n)? y
reboot: Restarting system

```

```
SVOS> secure-mode status
enhanced secure mode is set.
SVOS>
~~~

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

sh

`sh`

Description

Launches a bash shell for support purposes. To quit bash, enter **exit**.

This command is not available if enhanced secure mode is set.

Example

Launching a bash shell:

```
SVOS> sh
switch:/cli/fs/home#
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`svos>`)	Administrators or local user group members with execution rights for this command.

system serviceos password-prompt

```
system serviceos password-prompt
no system serviceos password-prompt
```

Description

Use this command to enable password authentication for ServiceOS. By default, the ServiceOS shell (accessible only from the local switch console port) requires no password to login as an admin use.

When this setting is enabled, the same password used to authenticate the admin user in the AOS-CX CLI or WeUI can be used to log in to the ServiceOS shell. If this setting is enabled, a forgotten admin user password cannot be reset using ServiceOS; if there are no other local or RADIUS/TACACS user accounts with administrator-level access, the switch must be zeroized by entering the **username zeroize** command at the ServiceOS login prompt to restore administrator access.

Example

Enablling password authentication for ServiceOS

```
switch(config)# system serviceos password-prompt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

umount

`umount <DEVICE>`

Description

Unmounts the SSD partitions mounted to the following locations: **/coredump**, **/logs**, **/nos**, **/selftest**, and unmounts the USB device mounted to **/mnt/usb**.

Parameter	Description
<DEVICE>	Specifies the device to be unmounted. Supported device options include **all** and **usb**.

Examples

Unmounting all devices:

```
SVOS> umount all
SVOS> umount usb
```

Unmounting a USB device:

```
SVOS> umount all
SVOS> umount usb
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

update

`update {primary | secondary} <IMAGE>`

Description

Verifies and installs a product image. The user can select the primary or secondary boot profile to update and the location of the file.

Parameter	Description
`{primary	secondary}`	Selects either the primary or secondary image.
<IMAGE>	Specifies the image name.

Examples

Updating the software image using TFTP:

The OOBM port is disabled on first boot and must be enabled using the **ip** command.

```
SVOS> ip dhcp
SVOS> ip show
Interface   : Link Up
IP Address : 192.0.2.22
Subnet Mask: 255.255.200.20
Gateway     : 10.0.24.1
SVOS> tftp -g -r XL.10.00.0001.swi -l image.swi 192.4.8.10
XL.10.00.0001.swi 100% |*******************************|   178M  0:00:00 ETA
SVOS> ls
image.swi
SVOS> update primary image.swi
Updating primary software image...
Verifying image...
Done
```

Update the software image using USB:

This example assumes that the user has preloaded a USB flash drive with the image to be updated. The image name on the flash drive is not important.

```
SVOS> mount usb
SVOS> ls /mnt/usb
image.swi
SVOS> update primary /mnt/usb/image.swi
Updating primary software image...
Verifying image...
Done
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (SVOS>)	Administrators or local user group members with execution rights for this command.

tftp

```
tftp {-b | -g | -l <LOCAL-FILE> | -p | -r <REMOTE-FILE>} host [<PORT>]
```

Description

Transfers files to and from a remote machine (TFTP a file).

Parameter	Description
{-b | -g | -l | -p | -r *<REMOTE-FILE>*}	Selects the options for transferring a file.
-b	Specifies the transfer blocks of size octets. The default blocksize is set to 1468, which can be overridden with the -b option.
-g	Specifies to get a file.
-l	Specifies a local file.
-p	Specifies to put a file in remote location.
-r *<REMOTE-FILE>*	Specifies a remote file.
<PORT>	Specifies the port for transfer. If no port option is specified, TFTP uses the standard UDP port 69 by default.

Example

Transferring files:

```
SVOS> tftp -b 65464 -g -r XL.10.00.0002.swi.swi 192.0.2.1
XL.10.00.0002 100% |*******************************|   178M  0:00:00 ETA
SVOS>
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.

version

`version`

Description

Displays the following build strings:

- Version.
- Build date.
- Build time.
- Build ID.
- SHA.

Example

Displaying version build strings:

```
SVOS> version
ServiceOS Information:
    Version:          GT.01.01.0001
    Build Date:       2017-07-19 14:52:31 PDT
    Build ID:         ServiceOS:GT.01.01.0001:461519208911:201707191452
    SHA:              461519208911 95cdb2267ea6889a3c6cbc3d4193
SVOS>
```

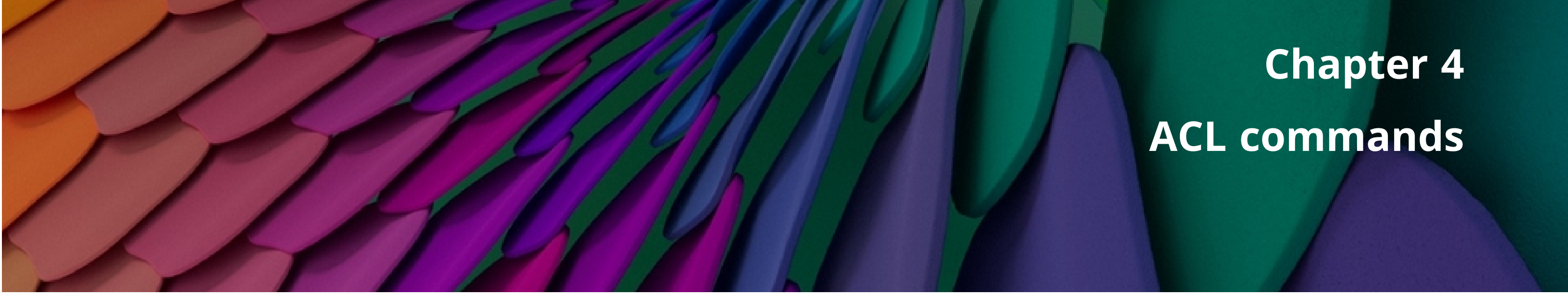
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	ServiceOS (`SVOS>`)	Administrators or local user group members with execution rights for this command.



Chapter 4
ACL commands

ACL application

ACLs can be applied as follows:

ACL type Direction	IPv4+6 In	IPv4+6 Out	MAC In	MAC Out
L2 interface (port)	Yes	Yes	Yes	Yes
L2 LAG	Yes	Yes	Yes	Yes
L3 interface (port)	Yes	Yes	Yes	Yes
L3 LAG	Yes	Yes	Yes	Yes
L3 interface (port) subinterface	Yes	Yes	Yes	Yes
L3 LAG subinterface	Yes	Yes	Yes	Yes
VLAN	Yes	Yes	Yes	Yes
Interface VLAN	Yes (routed)	Yes (routed)		
Management interface	Yes			
Control Plane (per VRF)	Yes			

The following match criteria is not supported. If this match criteria is attempted to be configured, an error message will be displayed and the action will not be completed.

```
TTL on IP ACLs
```

To apply IPv4 and/or IPv6 ACLs to the management interface, apply them to the Control Plane on the management VRF.

access-list copy

```
access-list {ip|ipv6|mac} <ACL-NAME> copy <DESTINATION-ACL>
```

Description

Copies an IPv4, IPv6, or MAC ACL to a new destination ACL or overwrites an existing ACL.

Parameter	Description
{ip|ipv6|mac}	Specifies the type of ACL.
<ACL-NAME>	Specifies the name of the ACL to be copied.
<DESTINATION-ACL>	Specifies the name of the destination ACL.

Examples

Copying *MY_IP_ACL* to *MY_IP_ACL2*:

```
switch(config)# access-list ip MY_IP_ACL copy MY_IP_ACL2
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv4       MY_IP_ACL
         1 permit                          udp
           any
           172.16.1.0/255.255.255.0
         2 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
         3 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
         4 deny                            any
           any
           any
           Hit-counts: enabled
--------------------------------------------------------------------------------
IPv4       MY_IP_ACL2
         1 permit                          udp
           any
           172.16.1.0/255.255.255.0
         2 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
         3 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
         4 deny                            any
           any
           any
           Hit-counts: enabled
```

Copying MY_IPV6_ACL to MY_IPV6_ACL2:

```
switch(config)# access-list ipv6 MY_IPV6_ACL copy MY_IPV6_ACL2
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
         1 permit                          udp
           any
           2001::1/64
         2 Permit all TCP ephemeral ports
           permit                          tcp
           2001:2001::2:1                   >  1023
           any
         3 permit                          tcp
           2001:2011::1/64
           any
         4 deny                            any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL2
         1 permit                          udp
           any
           2001::1/64
         2 Permit all TCP ephemeral ports
           permit                          tcp
           2001:2001::2:1                   >  1023
           any
         3 permit                          tcp
           2001:2011::1/64
           any
         4 deny                            any
           any
           any
           Hit-counts: enabled
```

Copying MY_MAC_ACL to MY_MAC_ACL2:

```
switch(config)# access-list mac MY_MAC_ACL copy MY_MAC_ACL2
switch(config-acl-mac)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL
         1 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
         2 permit                          any
```

```
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
         3 Permit all vlan-1 tagged Appletalk traffic
           permit                          appletalk
           any
           any
           VLAN: 1
         4 deny                            any
           any
           any
           Hit-counts: enabled
--------------------------------------------------------------------------------
MAC        MY_MAC_ACL2
         1 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
         2 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
         3 Permit all vlan-1 tagged Appletalk traffic
           permit                          appletalk
           any
           any
           VLAN: 1
         4 deny                            any
           any
           any
           Hit-counts: enabled
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
MAC        MY_MAC_ACL
         1 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
         2 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
         3 Permit all vlan-1 tagged Appletalk traffic
           permit                          appletalk
           any
           any
           VLAN: 1
         4 deny                            any
           any
           any
           Hit-counts: enabled
--------------------------------------------------------------------------------
MAC        MY_MAC_ACL2
         1 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
         2 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
```

```
            QoS Priority Code Point: 4
          3 Permit all vlan-1 tagged Appletalk traffic
            permit                           appletalk
            any
            any
            VLAN: 1
          4 deny                             any
            any
            any
            Hit-counts: enabled
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

access-list ip

Syntax to create an IPv4 ACL and enter its context. Plus syntax to remove an ACL:

```
access-list ip <ACL-NAME>
no access-list ip <ACL-NAME>
```

Syntax (within the ACL context) for creating or removing ACEs for protocols **ah**, **gre**, **esp**, **igmp**, **ospf**, **pim** (**ip** is available as an alias for **any**):

```
  [<SEQUENCE-NUMBER>]
  {permit|deny}
  {any|ip|ah|gre|esp|igmp|ospf|pim|<IP-PROTOCOL-NUM>}
  {any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}
  {any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}
  [dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
  [tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count] [log]

  no <SEQUENCE-NUMBER>
```

Syntax (within the ACL context) for creating or removing ACEs for protocols `sctp`, `tcp`, `udp`:

```
  [<SEQUENCE-NUMBER>]
  {permit|deny}
  {sctp|tcp|udp}
  {any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}
  [{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|group <PORT-GROUP>]
  {any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}
  [{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|group <PORT-GROUP>]
  [urg] [ack] [psh] [rst] [syn] [fin] [established]
  [dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
  [tos <TOS-VALUE>]  [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count] [log]
```

```
no <SEQUENCE-NUMBER>
```

Syntax (within the ACL context) for creating or removing ACEs for protocol `icmp`:

```
[<SEQUENCE-NUMBER>]
{permit|deny}
{icmp}
{any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}
{any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}
[icmp-type {echo|echo-reply|<ICMP-TYPE-VALUE>}] [icmp-code <ICMP-CODE-VALUE>]
[dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
[tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count] [log]

no <SEQUENCE-NUMBER>
```

Syntax (within the ACL context) for ACE comments:

```
[<SEQUENCE-NUMBER>] comment <TEXT-STRING>

no <SEQUENCE-NUMBER> comment
```

Description

Creates an IPv4 Access Control List (ACL) comprised of one or more Access Control Entries (ACEs) ordered and prioritized by sequence number. The lowest sequence number is the highest prioritized ACE.

The **no** form of this command deletes the entire ACL, or deletes an ACE identified by sequence number, or deletes only the comment from the ACE identified by sequence number.

Parameter	Description
<ACL-NAME>	Specifies the name of this ACL.
<SEQUENCE-NUMBER>	Specifies a sequence number for the ACE. Range: 1 to 4294967295.
`{permit|deny}`	Specifies whether to permit or deny traffic matching this ACE.
<IP-PROTOCOL-NUM>	Specifies the protocol as its Internet Protocol number. For example, 2 corresponds to the IGMP protocol. Range: 0 to 255.
`{any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}`	Specifies the source IPv4 address. ■ **any** - specifies any source IPv4 address. ■ ***<SRC-IP-ADDRESS>*** - specifies the source IPv4 host address. ○ ***<PREFIX-LENGTH>*** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 32. ○ ***<SUBNET-MASK>*** - specifies the address bits to mask (dotted decimal notation). ■ ***<ADDRESS-GROUP>*** - specifies an IPv4 address group defined with **object-group ip address**.
`{any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]|<ADDRESS-GROUP>}`	Specifies the destination IPv4 address. ■ **any** - specifies any destination IPv4 address. ■ ***<DST-IP-ADDRESS>*** - specifies the destination IPv4

Parameter	Description
	host address. ◦ ***<PREFIX-LENGTH>*** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 32. ◦ ***<SUBNET-MASK>*** - specifies the address bits to mask (dotted decimal notation). ■ ***<ADDRESS-GROUP>*** - specifies an IPv4 address group that you defined earlier with `object-group ip address`.
`[{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|group <PORT-GROUP>]`	Specifies the port, port range, or port group. Port numbers are in the range of 0 to 65535. ■ **eq *<PORT>*** - specifies the Layer 4 port. ■ **gt *<PORT>*** - specifies any Layer 4 port greater than the indicated port. ■ **lt *<PORT>*** - specifies any Layer 4 port less than the indicated port. ■ **range *<MIN-PORT> <MAX-PORT>*** - specifies the Layer 4 port range. ■ **group *<PORT-GROUP>*** - specifies the Layer 4 port group that you defined earlier with `object-group port`. **NOTE:** Upon application of the ACL, ACEs with L4 port ranges may consume more than one hardware entry.
`urg`	Specifies matching on the TCP Flag: **Urgent**.
`ack`	Specifies matching on the TCP Flag: **Acknowledgment**.
`psh`	Specifies matching on the TCP Flag: **Push buffered data to receiving application**.
`rst`	Specifies matching on the TCP Flag: **Reset the connection**.
`syn`	Specifies matching on the TCP Flag: **Synchronize sequence numbers**.
`fin`	Specifies matching on the TCP Flag: **Finish connection**.
`established`	Specifies matching on the TCP Flag: Established connection.
`[icmp-type {echo|echo-reply| <ICMP-TYPE-VALUE>}]`	Specifies the ICMP type. ■ **echo** - specifies an ICMP echo request packet. ■ **echo-reply** - specifies an ICMP echo reply packet. ■ ***<ICMP-TYPE-VALUE>*** - specifies an ICMP type

Parameter	Description
	value. Range: 0 to 255.
`[icmp-code <ICMP-CODE-VALUE>]`	Specifies the ICMP code value. Range: 0 to 255.
`dscp DSCP-SPECIFIER>`	Specifies the Differentiated Services Code Point (DSCP), either a numeric ***<DSCP-VALUE>*** (0 to 63) or one of these keywords: ▪ **AF11** - DSCP 10 (Assured Forwarding Class 1, low drop probability) ▪ **AF12** - DSCP 12 (Assured Forwarding Class 1, medium drop probability) ▪ **AF13** - DSCP 14 (Assured Forwarding Class 1, high drop probability) ▪ **AF21** - DSCP 18 (Assured Forwarding Class 2, low drop probability) ▪ **AF22** - DSCP 20 (Assured Forwarding Class 2, medium drop probability) ▪ **AF23** - DSCP 22 (Assured Forwarding Class 2, high drop probability) ▪ **AF31** - DSCP 26 (Assured Forwarding Class 3, low drop probability) ▪ **AF32** - DSCP 28 (Assured Forwarding Class 3, medium drop probability) ▪ **AF33** - DSCP 30 (Assured Forwarding Class 3, high drop probability) ▪ **AF41** - DSCP 34 (Assured Forwarding Class 4, low drop probability) ▪ **AF42** - DSCP 36 (Assured Forwarding Class 4, medium drop probability) ▪ **AF43** - DSCP 38 (Assured Forwarding Class 4, high drop probability) ▪ **CS0** - DSCP 0 (Class Selector 0: Default) ▪ **CS1** - DSCP 8 (Class Selector 1: Scavenger) ▪ **CS2** - DSCP 16 (Class Selector 2: OAM) ▪ **CS3** - DSCP 24 (Class Selector 3: Signaling) ▪ **CS4** - DSCP 32 (Class Selector 4: Real time) ▪ **CS5** - DSCP 40 (Class Selector 5: Broadcast video) ▪ **CS6** - DSCP 48 (Class Selector 6: Network control) ▪ **CS7** - DSCP 56 (Class Selector 7) ▪ **EF** - DSCP 46 (Expedited Forwarding)
`ecn <ECN-VALUE>`	Specifies an Explicit Congestion Notification value. Range: 0 to 3.
`ip-precedence <IP-PRECEDENCE-VALUE>`	Specifies an IP precedence value. Range: 0 to 7.
`tos <TOS-VALUE>`	Specifies the Type of Service value. Range: 0 to 31.
`fragment`	Specifies a fragment packet.
`vlan <VLAN-ID>`	Specifies VLAN tag to match on. 802.1Q VLAN ID.

Parameter	Description
	NOTE: This parameter cannot be used in any ACL that will be applied to a VLAN.
`ttl <TTL-VALUE>`	Specifies a time-to-live (hop limit) value. Range: 0 to 255. Not supported for ACLs.
`count`	Keeps the hit counts of the number of packets matching this ACE.
`log`	Keeps a log of the number of packets matching this ACE. Works with both `permit` and `deny` actions. Works with ACLs applied on ingress, egress, or Control Plane.
`[<SEQUENCE-NUMBER>] comment <TEXT-STRING>`	Adds a comment to an ACE. The **no** form removes only the comment from the ACE.

Usage

- If the ***<IP-PROTOCOL-NUM>*** parameter is used instead of a protocol name, ensure that any needed ACE-definition parameters specific to the selected protocol are also provided.
- When using multiple ACL types (IPv4, IPv6, or MAC) with logging on the same interface, the first packet that matches an ACE with `log` option is logged. Until the log-timer wait-period is over, any packets matching other ACL types do not create a log. At the end of the wait-period, the switch creates a summary log for all the ACLs that were matched, regardless of type.

Examples

Creating an IPv4 ACL with four entries:

```
switch(config)# access-list ip MY_IP_ACL
switch(config-acl-ip)# 10 permit udp any 172.16.1.0/24
switch(config-acl-ip)# 20 permit tcp 172.16.2.0/16 gt 1023 any
switch(config-acl-ip)# 30 permit tcp 172.26.1.0/24 any syn ack dscp 10
switch(config-acl-ip)# 40 deny any any any count
switch(config-acl-ip)# exit

switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Adding a comment to an existing IPv4 ACE:

```
switch(config)# access-list ip MY_IP_ACL
switch(config-acl-ip)# 20 comment Permit all TCP ephemeral ports
switch(config-acl-ip)# exit

switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 Permit all TCP ephemeral ports
           permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing a comment from an existing IPv4 ACE:

```
switch(config)# access-list ip MY_IP_ACL
switch(config-acl-ip)# no 20 comment
switch(config-acl-ip)# exit

switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Adding an ACE (insert line 25) to an existing IPv4 ACL:

```
switch(config)# access-list ip MY_IP_ACL
switch(config-acl-ip)# 25 permit icmp 172.16.2.0/16 any
switch(config-acl-ip)# exit

switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        25 permit                          icmp
           172.16.2.0/255.255.0.0 any
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Replacing an ACE in an existing IPv4 ACL:

```
switch(config)# access-list ip MY_IP_ACL
switch(config-acl-ip)# 25 permit icmp 172.17.1.0/16 any
switch(config-acl-ip)# exit

switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        25 permit                          icmp
           172.17.1.0/255.255.0.0
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        25 permit                          icmp
           172.17.1.0/255.255.0.0
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing an ACE from an IPv4 ACL:

```
switch(config)# access-list ip MY_IP_ACL
switch(config-acl-ip)# no 25
switch(config-acl-ip)# exit

switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Copy an IPv4 ACL:

```
switch(config)# access-list ip MY_IP_ACL copy MY_IP_ACL2
switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10
           permit                          udp
           any
           172.16.1.0/255.255.255.0
        20
           permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30
           permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40
           deny                            any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL2
        10
           permit                          udp
           any
           172.16.1.0/255.255.255.0
        20
           permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30
           permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40
           deny                            any
           any
           any
           Hit-counts: enabled switch(config)# access-list ip MY_IP_ACL copy MY_
IP_ACL2
switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10
           permit                          udp
           any
           172.16.1.0/255.255.255.0
        20
           permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30
           permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40
           deny                            any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL2
        10
           permit                          udp
           any
           172.16.1.0/255.255.255.0
        20
           permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
        30
           permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
        40
           deny                            any
           any
           any
           Hit-counts: enabled
```

Removing an IPv4 ACL:

```
switch(config)# no access-list ip MY_IP_ACL

switch(config)# show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL2
         1 permit                          udp
           any
           172.16.1.0/255.255.255.0
         2 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
         3 permit                          tcp
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
         4 deny                            any
           any
           any
           Hit-counts: enabled
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.12	Allow ACLs applied to the Control Plane to be logged.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The **access-list ip *<ACL-NAME>*** command takes you into the named ACL context where you enter the ACEs.	Administrators or local user group members with execution rights for this command.

access-list ipv6

Syntax to create an IPv6 ACL and enter its context. Plus syntax to remove an ACL:

```
access-list ipv6 <ACL-NAME>
no access-list ipv6 <ACL-NAME>
```

Syntax (within the ACL context) for creating or removing ACEs for protocols **ah**, **gre**, **esp**, **ospf**, **pim** (**ipv6** is available as an alias for **any**):

```
  [<SEQUENCE-NUMBER>]
  {permit|deny}
  {any|ipv6|ah|gre|esp|ospf|pim|<IP-PROTOCOL-NUM>}
  {any|<SRC-IP-ADDRESS>[/<PREFIX-LENGTH>]|<ADDRESS-GROUP>}
  {any|<DST-IP-ADDRESS>[/<PREFIX-LENGTH>]|<ADDRESS-GROUP>}
  [dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
  [tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count] [log]

  no <SEQUENCE-NUMBER>
```

Syntax (within the ACL context) for creating or removing ACEs for protocols `sctp`, `tcp`, `udp`:

```
  [<SEQUENCE-NUMBER>]
  {permit|deny}
  {sctp|tcp|udp}
  {any|<SRC-IP-ADDRESS>[/<PREFIX-LENGTH>}]|<ADDRESS-GROUP>}
  [{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|group <PORT-GROUP>]
  {any|<DST-IP-ADDRESS>[/<PREFIX-LENGTH>]|<ADDRESS-GROUP>}
  [{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|group <PORT-GROUP>]
  [urg] [ack] [psh] [rst] [syn] [fin] [established]
  [dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
  [tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count] [log]

  no <SEQUENCE-NUMBER>
```

Syntax (within the ACL context) for creating or removing ACEs for protocol `icmpv6`:

```
  [<SEQUENCE-NUMBER>]
  {permit|deny}
  {icmpv6}
```

```
    {any|<SRC-IP-ADDRESS>[/<PREFIX-LENGTH>]|<ADDRESS-GROUP>}
    {any|<DST-IP-ADDRESS>[/<PREFIX-LENGTH>]|<ADDRESS-GROUP>}
    [icmp-type {echo|echo-reply|<ICMP-TYPE-VALUE>}] [icmp-code <ICMP-CODE-VALUE>]
    [dscp <DSCP-SPECIFIER>][ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
    [tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count] [log]

  no <SEQUENCE-NUMBER>
```

Syntax (within the ACL context) for ACE comments:

```
  [<SEQUENCE-NUMBER>] comment <TEXT-STRING>

  no <SEQUENCE-NUMBER> comment
```

Description

Creates an IPv6 Access Control List (ACL). The ACL is made of one or more Access Control Entries (ACEs) ordered and prioritized by sequence number. The lowest sequence number is the highest prioritized ACE.

The **no** form of this command deletes the entire ACL, or deletes an ACE identified by sequence number, or deletes only the comment from the ACE identified by sequence number.

Parameter	Description
<ACL-NAME>	Specifies the name of this ACL.
<SEQUENCE-NUMBER>	Specifies a sequence number for the ACE. Range: 1 to 4294967295.
{permit|deny}	Specifies whether to permit or deny traffic matching this ACE.
<IP-PROTOCOL-NUM>	Specifies the protocol as its Internet Protocol number. For example, 2 corresponds to the IGMP protocol. Range: 0 to 255.
{any|*<SRC-IP-ADDRESS>*[/*<PREFIX-LENGTH>*]|*<ADDRESS-GROUP>*}	Specifies the source IPv6 address. ■ **any** - specifies any source IPv6 address. ■ ***<SRC-IP-ADDRESS>*** - specifies the source IPv6 host address. ○ ***<PREFIX-LENGTH>*** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 128. ■ ***<ADDRESS-GROUP>*** - specifies an IPv6 address group that you defined earlier with **object-group ipv6 address**.
{any|*<DST-IP-ADDRESS>*[/*<PREFIX-LENGTH>*]|*<ADDRESS-GROUP>*}	Specifies the destination IPv6 address. ■ **any** - specifies any destination IPv6 address. ■ ***<DST-IP-ADDRESS>*** - specifies the destination IPv6 host address. ○ ***<PREFIX-LENGTH>*** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 128. ■ ***<ADDRESS-GROUP>*** - specifies an IPv6 address group that you defined earlier with `object-group ipv6 address`.

Parameter	Description
`[{eq|gt|lt} <PORT>|range <MIN-PORT><MAX-PORT>|group <PORT-GROUP>]`	Specifies the port, port range, or port group. Port numbers are in the range of 0 to 65535. - **eq *<PORT>*** - specifies the Layer 4 port. - **gt *<PORT>*** - specifies any Layer 4 port greater than the indicated port. - **lt *<PORT>*** - specifies any Layer 4 port less than the indicated port. - **range *<MIN-PORT>* *<MAX-PORT>*** - specifies the Layer 4 port range. - **group *<PORT-GROUP>*** - specifies the Layer 4 port group that you defined earlier with `object-group port`. **NOTE:** Upon application of the ACL, ACEs with L4 port ranges may consume more than one hardware entry.
`urg, ack, psh, rst, syn, fin, established`	These TCP flag-matching parameters are supported for both ingress and egress.
`[icmp-type {echo|echo-reply|<ICMP-TYPE-VALUE>}]`	Specifies the ICMP type. - **echo** - specifies an ICMP echo request packet. - **echo-reply** - specifies an ICMP echo reply packet. - ***<ICMP-TYPE-VALUE>*** - specifies an ICMP type value. Range: 0 to 255.
`[icmp-code <ICMP-CODE-VALUE>]`	Specifies the ICMP code value. Range: 0 to 255.
`dscp DSCP-SPECIFIER>`	Specifies the Differentiated Services Code Point (DSCP), either a numeric ***<DSCP-VALUE>*** (0 to 63) or one of these keywords: - **AF11** - DSCP 10 (Assured Forwarding Class 1, low drop probability) - **AF12** - DSCP 12 (Assured Forwarding Class 1, medium drop probability) - **AF13** - DSCP 14 (Assured Forwarding Class 1, high drop probability) - **AF21** - DSCP 18 (Assured Forwarding Class 2, low drop probability) - **AF22** - DSCP 20 (Assured Forwarding Class 2, medium drop probability) - **AF23** - DSCP 22 (Assured Forwarding Class 2, high drop probability) - **AF31** - DSCP 26 (Assured Forwarding Class 3, low drop probability) - **AF32** - DSCP 28 (Assured Forwarding Class 3, medium drop probability) - **AF33** - DSCP 30 (Assured Forwarding Class 3, high drop probability) - **AF41** - DSCP 34 (Assured Forwarding Class 4, low drop probability)

Parameter	Description
	- **AF42** - DSCP 36 (Assured Forwarding Class 4, medium drop probability) - **AF43** - DSCP 38 (Assured Forwarding Class 4, high drop probability) - **CS0** - DSCP 0 (Class Selector 0: Default) - **CS1** - DSCP 8 (Class Selector 1: Scavenger) - **CS2** - DSCP 16 (Class Selector 2: OAM) - **CS3** - DSCP 24 (Class Selector 3: Signaling) - **CS4** - DSCP 32 (Class Selector 4: Real time) - **CS5** - DSCP 40 (Class Selector 5: Broadcast video) - **CS6** - DSCP 48 (Class Selector 6: Network control) - **CS7** - DSCP 56 (Class Selector 7) - **EF** - DSCP 46 (Expedited Forwarding)
`ecn` *`<ECN-VALUE>`*	Specifies an Explicit Congestion Notification value. Range: 0- 3.
`ip-precedence` *`<IP-PRECEDENCE-VALUE>`*	Specifies an IP precedence value. Range: 0-7.
`tos` *`<TOS-VALUE>`*	Specifies the Type of Service value. Range: 0-31.
`fragment`	Specifies a fragment packet.
`vlan` *`<VLAN-ID>`*	Specifies VLAN tag to match on. 802.1Q VLAN ID. **NOTE:** This parameter cannot be used in any ACL that will be applied to a VLAN.
`ttl` *`<TTL-VALUE>`*	Not supported.
`count`	Keeps the hit counts of the number of packets matching this ACE.
`log`	Keeps a log of the number of packets matching this ACE. Works with both `permit` and `deny` actions. Works with ACLs applied on ingress, egress, or Control Plane.
`[`*`<SEQUENCE-NUMBER>`*`] comment` *`<TEXT-STRING>`*	Adds a comment to an ACE. The **no** form removes only the comment from the ACE.

Usage

- If the ***<IP-PROTOCOL-NUM>*** parameter is used instead of a protocol name, ensure that any needed ACE-definition parameters specific to the selected protocol are also provided.
- When using multiple ACL types (IPv4, IPv6, or MAC) with logging on the same interface, the first packet that matches an ACE with `log` option is logged. Until the log-timer wait-period is over, any packets matching other ACL types do not create a log. At the end of the wait-period, the switch creates a summary log all the ACLs that were matched, regardless of type.

Examples

Creating an IPv6 ACL with four entries:

```
switch(config)# access-list ipv6 MY_IPV6_ACL
switch(config-acl-ipv6)# 10 permit udp any 2001::1/64
switch(config-acl-ipv6)# 20 permit tcp 2001:2001::2:1/128 gt 1023 any
switch(config-acl-ipv6)# 30 permit tcp 2001:2011::1/64 any
switch(config-acl-ipv6)# 40 deny any any any count
switch(config-acl-ipv6)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 permit                          tcp
           2001:2001::2:1                   >  1023
           any
        30 permit                          tcp
           2001:2011::1/64
           any
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Adding a comment to an existing IPv6 ACE:

```
switch(config)# access-list ipv6 MY_IPV6_ACL
switch(config-acl-ipv6)# 20 comment Permit all TCP ephemeral ports
switch(config-acl-ipv6)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 Permit all TCP ephemeral ports
           permit                          tcp
           2001:2001::2:1                   >  1023
           any
        30 permit                          tcp
           2001:2011::1/64
           any
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing a comment from an existing IPv6 ACE:

```
switch(config)# access-list ipv6 MY_IPV6_ACL
switch(config-acl-ipv6)# no 20 comment
switch(config-acl-ipv6)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                             L3 Protocol
           Source IP Address                  Source L4 Port(s)
           Destination IP Address             Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                             udp
           any
           2001::1/64
        20 permit                             tcp
           2001:2001::2:1                      >  1023
           any
        30 permit                             tcp
           2001:2011::1/64
           any
        40 deny                               any
           any
           any
           Hit-counts: enabled
```

Adding an ACE to an existing IPv6 ACL:

```
switch(config)# access-list ipv6 MY_IPV6_ACL
switch(config-acl-ipv6)# 25 permit icmpv6 2001::1/64 any
switch(config-acl-ipv6)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                             L3 Protocol
           Source IP Address                  Source L4 Port(s)
           Destination IP Address             Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                             udp
           any
           2001::1/64
        20 permit                             tcp
           2001:2001::2:1                      >  1023
           any
        25 permit                             icmpv6
           2001::1/64
           any
        30 permit                             tcp
           2001:2011::1/64
           any
        40 deny                               any
           any
           any
           Hit-counts: enabled
```

Replacing an ACE in an existing IPv6 ACL:

```
switch(config)# access-list ipv6 MY_IPV6_ACL
switch(config-acl-ipv6)# 25 permit icmpv6 2001::2:1/64 any
switch(config-acl-ipv6)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 permit                          tcp
           2001:2001::2:1                   >  1023
           any
        25 permit                          icmpv6
           2001::2:1/64
           any
        30 permit                          tcp
           2001:2011::1/64
           any
        40 deny                            any
           any
           any
           Hit-counts: enabled

Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 permit                          tcp
           2001:2001::2:1                   >  1023
           any
        25 permit                          icmpv6
           2001::2:1/64
           any
        30 permit                          tcp
           2001:2011::1/64
           any
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing an ACE from an IPv6 ACL:

```
switch(config)# access-list ipv6 MY_IPV6_ACL
switch(config-acl-ipv6)# no 25
switch(config-acl-ipv6)# exit
switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 permit                          tcp
           2001:2001::2:1                   >  1023
           any
        30 permit                          tcp
           2001:2011::1/64
           any
        40 deny                            any
           any
           any
           Hit-counts: enabled

Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 permit                          tcp
           2001:2001::2:1                   >  1023
           any
        30 permit                          tcp
           2001:2011::1/64
           any
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing an IPv6 ACL:

```
switch(config)# no access-list ipv6 MY_IPV6_ACL

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL2
         1 permit                          udp
           any
           2001::1/64
```

```
          2 Permit all TCP ephemeral ports
            permit                          tcp
            2001:2001::2:1                   >  1023
            any
          3 permit                          tcp
            2001:2011::1/64
            any
          4 deny                            any
            any
            any
            Hit-counts: enabled
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.12	Allow ACLs applied to the Control Plane to be logged.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The **access-list ipv6 <ACL-NAME>** command takes you into the named ACL context where you enter the ACEs.	Administrators or local user group members with execution rights for this command.

access-list log-timer

`access-list log-timer {default|<INTERVAL>}`

Description

Sets the log timer interval for all ACEs that have the **log** parameter configured.

Parameter	Description
`default`	Resets the log timer to its default 300 seconds.
`<INTERVAL>`	Specifies the log timer interval in seconds. Range: 5 to 300.

Usage

- ACL logging keeps a log of the number of packets matching this ACE. Works with both `permit` and `deny` actions. Works with ACLs applied on ingress, egress, or Control Plane.

- The first packet that matches an ACE with the **log** parameter within an ACL log timer window (configured with the **access-list log-timer** command) has its header contents extracted and sent to the configured logging destination, such as the console and syslog server. Each time the ACL log timer expires, a summary of all ACEs with **log** configured are sent to the logging destination. This capability allows throttling of logging ACL hits.
- If no further log messages are generated in the wait-period, the switch suspends the timer and resets itself to log as soon as a new match occurs.
- When using multiple ACL types (IPv4, IPv6, or MAC) with logging on the same interface, the first packet that matches an ACE with the `log` option is logged. Any packets, matching other ACL types, do not create a log until the log-timer wait-period is over. At the end of the wait-period, a summary log is made of all the ACLs that were matched, regardless of type.

Remarked ACL traffic may lose logging information when a QoS action or a classifier policy with remark is enabled. A classifier policy with remark takes precedence over QoS actions and QoS actions takes precedence over ACL remarked traffic.

- You may see a minor discrepancy between the ACL logging statistics and the hit counts statistics due to the time required to record the log message.

Examples

Although these examples use debug logging, you can alternatively use event logging.

On the 6400 Switch Series, interface identification differs.

Enabling debug logging for the ACL logging module:

```
switch# debug acl log severity info
switch# show debug
----------------------------------------------------------------
module sub_module severity vlan  port   ip     mac  instance vrf
----------------------------------------------------------------
acl    acl_log    info     ----- -----  -----  ---- -----    ---
```

Setting the debug destination to console with the minimum security level of info:

```
switch# debug destination console severity info
switch# show debug destination
---------------------------------------------------------------------
                show debug destination
---------------------------------------------------------------------
CONSOLE:info
```

Setting the access list log-timer to 30 seconds:

```
switch(config)# access-list log-timer 30
switch(config)# do show access-list log-timer
ACL log timer length (frequency): 30 seconds
```

Creating an IPv4 ACL with one entry with the log parameter:

```
switch(config)# access-list ip MY_IP_ACL
switch(config-acl-ip)# deny icmp 1.1.1.1 1.1.1.2 log
switch(config-acl-ip)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
        10 deny                            icmp
           1.1.1.1
           1.1.1.2
           Logging: enabled
           Hit-counts: enabled
```

Enabling interface 1/1/1 and applying the ACL:

```
switch(config)# interface 1/1/1
switch(config-if)# no shutdown
switch(config-if)# no routing
switch(config-if)# apply access-list ip MY_IP_ACL in
switch(config-if)# do show running-config interface 1/1/1
interface 1/1/1
   no shutdown
   apply access-list ip MY_IP_ACL in
   no routing
   vlan access 1
   exit
```

Sending packets that will match the ACE and observe the ACL logging message on the console:

```
2017-10-10T20:13:36.044+00:00 ops-switchd[875]: debug|LOG_INFO|AMM|1/5|ACL|ACL_
LOG|
List MY_IP_ACL, seq# 10 denied icmp 1.1.1.1 -> 1.1.1.2 type 8 code 0,
on vlan 1, port 1/1/1, direction in
```

When the access list log-timer expires, the summary message is printed on the console. The number 30 is the number of packets received during the last access list log-timer window.

```
2017-10-10T20:14:06.051+00:00 ops-switchd[875]: debug|LOG_INFO|AMM|1/5|ACL|ACL_
LOG|
MY_IP_ACL on 1/1/1 (in): 30  10 deny icmp 1.1.1.1 1.1.1.2 log count
```

Resetting the ACL log timer to the default value:

```
switch(config)# access-list log-timer default
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.12	Allow ACLs applied to the Control Plane to be logged.
10.09	<INTERVAL> parameter range changed to **5 to 300**. Was 30 to 300.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

access-list mac

```
access-list mac <ACL-NAME>
no access-list mac <ACL-NAME>

[<SEQUENCE-NUMBER>]
{permit|deny}
{any|<SRC-MAC-ADDRESS>[/<ETHERNET-MASK>]]}
{any|<DST-MAC-ADDRESS>[/<ETHERNET-MASK>]]}
{any|aarp|appletalk|arp|fcoe|fcoe-init|ip|ipv6|
      ipx-arpa|ipx-non-arpa|is-is|lldp|mpls-multicast|mpls-unicast|q-in-q|
      rbridge|trill|wake-on-lan|<NUMERIC-ETHERTYPE>}
[pcp <PCP-VALUE>] [vlan <VLAN-ID>] [count] [log]
no <SEQUENCE-NUMBER>

[<SEQUENCE-NUMBER>] comment <TEXT-STRING>
no <SEQUENCE-NUMBER> comment
```

Description

Creates a MAC Access Control List (ACL). The ACL is made of one or more Access Control Entries (ACEs) ordered and prioritized by sequence numbers. The lowest sequence number is the highest prioritized ACE.

The **no** form of this command deletes the entire ACL, or deletes an ACE identified by sequence number, or deletes only the comment from the ACE identified by sequence number.

Parameter	Description
<ACL-NAME>	Specifies the name of this ACL.
<SEQUENCE-NUMBER>	Specifies a sequence number for the ACE. Range: 1 to 4294967295.
`{permit|deny}`	Specifies whether to permit or deny traffic matching this ACE.
`comment`	Specifies storing the remaining entered text as an ACE comment.
`{any|<SRC-MAC-ADDRESS>`	Specifies the source host MAC address (xxxx.xxxx.xxxx), OUI, or

Parameter	Description
`[/<ETHERNET-MASK>}]}`	the keyword `any`. You can optionally include the following: *<ETHERNET-MASK>* - The address bits to mask (xxxx.xxxx.xxxx).
`{any|<DST-MAC-ADDRESS> [/<ETHERNET-MASK>}]}`	Specifies the destination host MAC address (xxxx.xxxx.xxxx), OUI, or the keyword `any`. You can optionally include the following: *<ETHERNET-MASK>* - The address bits to mask (xxxx.xxxx.xxxx).
`{any|aarp|appletalk| ... |wake-on-lan|<NUMERIC-ETHERTYPE>`	Specifics the protocol encapsulated in the Ethernet frame. The encapsulated protocol is identified by the EtherType Ethernet field. The EtherType is specified in one of the following three ways: ■ `any` - any EtherType. ■ *<NUMERIC-ETHERTYPE>* - the numerical EtherType protocol number. Range: 0x600 to 0xffff. ■ One of these EtherType protocol name keywords: ○ `aarp` ○ `appletalk` ○ `arp` ○ `fcoe` ○ `fcoe-init` ○ `ip` ○ `ipv6` ○ `ipx-arpa` ○ `ipx-non-arpa` ○ `is-is` ○ `lldp` ○ `mpls-multicast` ○ `mpls-unicast` ○ `q-in-q` ○ `rbridge` ○ `trill` ○ `wake-on-lan`
`pcp <PCP-VALUE>`	Specifies 802.1Q QoS Priority Code Point value. Range: 0 to 7.
`vlan <VID>`	Specifies a VLAN ID. The VLAN ID must exist. **NOTE:** This parameter cannot be used in any ACL that will be applied to a VLAN.
`count`	Keeps the hit counts of the number of packets matching this ACE.
`log`	Keeps a log of the number of packets matching this ACE. Works with both `permit` and `deny` actions. Works with ACLs applied on ingress or egress.

Usage

When using multiple ACL types (IPv4, IPv6, or MAC) with logging on the same interface, the first packet that matches an ACE with `log` option is logged. Until the log-timer wait-period is over, any packets matching other ACL types do not create a log. At the end of the wait-period, the switch creates a summary log all the ACLs that were matched, regardless of type.

Examples

Creating a MAC ACL with four entries:

```
switch(config)# access-list mac MY_MAC_ACL
switch(config-acl-ip)# 10 permit 1122.3344.5566/ffff.ffff.0000 any ipv6
switch(config-acl-ip)# 20 permit aaaa.bbbb.cccc 1111.2222.3333 any pcp 4
switch(config-acl-ip)# 30 permit any any appletalk vlan 40
switch(config-acl-ip)# 40 deny any any any count
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
MAC        MY_MAC_ACL
        10 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30 permit                          appletalk
           any
           any
           VLAN: 40
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Adding a comment to an existing MAC ACE:

```
switch(config)# access-list mac MY_MAC_ACL
switch(config-acl-ip)# 30 comment Permit all vlan-40 tagged Appletalk traffic
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
MAC        MY_MAC_ACL
        10 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20 permit                          any
```

```
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30 Permit all vlan-40 tagged Appletalk traffic
           permit                          appletalk
           any
           any
           VLAN: 40
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing a comment from an existing MAC ACE:

```
switch(config)# access-list mac MY_MAC_ACL
switch(config-acl-mac)# no 30 comment
switch(config-acl-mac)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL
        10 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30 permit                          appletalk
           any
           any
           VLAN: 1
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Adding an ACE to an existing MAC ACL:

```
switch(config)# access-list mac MY_MAC_ACL
switch(config-acl-ip)# 35 permit any aabb.cc11.1234 0xffee
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL
```

```
        10 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30 permit                          appletalk
           any
           any
           VLAN: 1
        35 permit                          0xffee
           any
           aabb.cc11.1234
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Replacing an ACE in an existing MAC ACL:

```
switch(config)# access-list mac MY_MAC_ACL
switch(config-acl-ip)# 35 permit any aabb.cc11.1234 0xeeee
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL
        10 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30 permit                          appletalk
           any
           any
           VLAN: 1
        35 permit                          0xeeee
           any
           aabb.cc11.1234
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing an ACE from an MAC ACL:

```
switch(config)# access-list mac MY_MAC_ACL
switch(config-acl-ip)# no 35
switch(config-acl-ip)# exit
switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL
        10 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30 permit                          appletalk
           any
           any
           VLAN: 1
        40 deny                            any
           any
           any
           Hit-counts: enabled
```

Removing a MAC ACL:

```
switch(config)# no access-list mac MY_MAC_ACL

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL2
         1 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
         2 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
         3 Permit all vlan-40 tagged Appletalk traffic
           permit                          appletalk
           any
           any
           VLAN: 1
         4 deny                            any
           any
           any
           Hit-counts: enabled
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The `access-list mac <ACL-NAME>` command takes you into the named ACL context where you enter the ACEs.	Administrators or local user group members with execution rights for this command.

access-list resequence

`access-list {ip|ipv6|mac} <ACL-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`

Description

Resequences the ACE sequence numbers in an ACL.

Parameter	Description
`{ip|ipv6|mac}`	Specifies the ACL type.
`<ACL-NAME>`	Specifies the ACL name.
`<STARTING-SEQUENCE-NUMBER>`	Specifies the starting sequence number.
`<INCREMENT>`	Specifies the sequence number increment.

Examples

Resequencing an IPv4 ACL to start at 1 with an increment of 1:

```
switch(config)# access-list ip MY_IP_ACL resequence 1 1
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_ACL
         1 permit                          udp
           any
           172.16.1.0/255.255.255.0
         2 permit                          tcp
           172.16.2.0/255.255.0.0           >  1023
           any
         3 permit                          tcp
```

```
           172.26.1.0/255.255.255.0
           any
           dscp: AF11
           ack
           syn
         4 deny                             any
           any
           any
           Hit-counts: enabled
```

Resequencing an IPv6 ACL to start at 1 with an increment of 1:

```
switch(config)# access-list ipv6 MY_IPV6_ACL resequence 1 1
switch(config-acl-ip)# exit

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                           L3 Protocol
           Source IP Address                Source L4 Port(s)
           Destination IP Address           Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
         1 permit                           udp
           any
           2001::1/64
         2 Permit all TCP ephemeral ports
           permit                           tcp
           2001:2001::2:1                    >  1023
           any
         3 permit                           tcp
           2001:2011::1/64
           any
         4 deny                             any
           any
           any
           Hit-counts: enabled
Type       Name
  Sequence Comment
           Action                           L3 Protocol
           Source IP Address                Source L4 Port(s)
           Destination IP Address           Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
         1 permit                           udp
           any
           2001::1/64
         2 Permit all TCP ephemeral ports
           permit                           tcp
           2001:2001::2:1                    >  1023
           any
         3 permit                           tcp
           2001:2011::1/64
           any
         4 deny                             any
           any
           any
           Hit-counts: enabled
```

Resequencing a MAC ACL to start at 1 with an increment of 1:

```
switch(config)# access-list mac MY_MAC_ACL resequence 1 1
switch(config-acl-mac)# exit

switch(config)# do show access-list
Type        Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL
         1 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
         2 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
         3 Permit all vlan-40 tagged Appletalk traffic
           permit                          appletalk
           any
           any
           VLAN: 1
         4 deny                            any
           any
           any
           Hit-counts: enabled
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

access-list reset

access-list {all|ip *<ACL-NAME>*|ipv6 *<ACL-NAME>*|mac *<ACL-NAME>*} reset

Description

Changes the user-specified ACL configuration to match the active ACL configuration. Use this command when a discrepancy exists between what the user configured and what is active and accepted by the system.

Parameter	Description
all|ip *ACL-NAME>*|ipv6 *<ACL-NAME>*|mac *<ACL-NAME>*	Specifies **one** of the following: ■ a reset of `all` ACLs. ■ a reset of a named IPv4 ACL. ■ a reset of a named IPv6 ACL. ■ a reset of a named MAC ACL.

Usage

The output of the **show access-list** command displays the active configuration of the product. The active configuration is the ACLs that have been configured and accepted by the system. The output of the **show access-list** command with the **configuration** parameter, displays the ACLs that have been configured. The output of this command may not be the same as what was programmed in hardware or what is active on the product.

If the active ACLs and user-configured ACLs are not the same, a warning message is displayed in the output of the show command. Modify the user-configured ACL until the warning message is no longer displayed or run the **access-list reset** command to change the user-specified configuration to match the active configuration.

Examples

On the 6400 Switch Series, interface identification differs.

Apply an ACL with TCP acknowledgments (ACKs) on ingress, which is unsupported by hardware:

```
switch(config-acl)# 10 permit tcp 172.16.2.0/16 any ack
```

Displaying the user-specified configuration:

```
switch(config)# do show access-list commands
! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
access-list ip TEST_ACL
! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
interface 1/1/1
    apply access-list ip TEST_ACL in

switch(config)# do show access-list commands configuration
! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
access-list ip TEST_ACL
    10 permit tcp 172.16.2.0/255.255.0.0 any ack
! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
interface 1/1/1
    apply access-list ip TEST_ACL in

switch(config)# do show access-list
Type       Name
  Sequence Comment
```

```
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
% Warning: TEST_ACL user configuration does not match active configuration.
%          run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
IPv4       TEST_ACL

switch(config)# do show access-list configuration
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
% Warning: TEST_ACL user configuration does not match active configuration.
%          run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
IPv4       TEST_ACL
        10
           permit                          tcp
           172.16.2.0/255.255.0.0
           any
           ack

! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
access-list ip TEST_ACL
! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
interface 1/1/1
    apply access-list ip TEST_ACL in

switch(config)# do show access-list commands configuration
! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
access-list ip TEST_ACL
    10 permit tcp 172.16.2.0/255.255.0.0 any ack
! access-list ip TEST_ACL user configuration does not match active configuration.
! run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
interface 1/1/1
    apply access-list ip TEST_ACL in

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
% Warning: TEST_ACL user configuration does not match active configuration.
%          run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
IPv4       TEST_ACL
```

```
switch(config)# do show access-list configuration
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
% Warning: TEST_ACL user configuration does not match active configuration.
%          run 'access-list TYPE NAME reset' to reset access-list to match active
configuration.
IPv4       TEST_ACL
        10
           permit                          tcp
           172.16.2.0/255.255.0.0
           any
           ack
```

Resetting the user-specified configuration to match the active configuration.

```
switch(config)# access-list ip TEST_ACL reset
```

Displaying the updated user-specified configuration.

```
switch(config)# do show access-list commands
access-list ip TEST_ACL
interface 1/1/1
    apply access-list ip TEST_ACL in

switch(config)# do show access-list commands configuration
access-list ip TEST_ACL
interface 1/1/1
    apply access-list ip TEST_ACL in

switch(config)# do show access-list
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       TEST_ACL

switch(config)# do show access-list configuration
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       TEST_ACL
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

access-list secure-update

```
access-list secure-update
no access list secure-update
```

Description

This command determines if access lists are updated using the secure-update feature. Secure-update is enabled by default.

When secure-update is enabled and an ACL is updated or replaced, one or more override entries are installed in the TCAM table(s) containing the ACL that is being modified. As a result, all traffic of the same type as the currently configured ACL will be denied on the interfaces to which the ACL is applied. This ensures that traffic is not temporarily allowed while modifying an ACL. Upon completion of the update, the TCAM override entries are uninstalled and traffic resumes ACL matching.

The **no** version of this command disables this feature. If secure-update is disabled, there will be no override entry installed. This results in the faster modification of an ACL and ensures that there is no interruption to previously permitted traffic, but may temporarily allow previously denied traffic to pass through the switch. Once the ACL has been modified, traffic will be processed by the updated ACL.

Examples

Disabling secure-update:

```
switch(config)# no access-list secure-update
```

Reenabling secure-update:

```
switch(config)# access-list secure-update
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Related Commands

Command	Description
`vsx-sync acl-secure-update`	If this setting is enabled and the primary VSX node has configurations with the access list secure-update feature enabled, this configuration can synchronize to the secondary peer. This setting is disabled by default. Refer to the *Virtual Switching Extension (VSX) Guide* for details.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

apply access-list control-plane

```
apply access-list {ip|ipv6} <ACL-NAME> control-plane vrf <VRF-NAME>
no apply access-list {ip|ipv6} <ACL-NAME> control-plane vrf <VRF-NAME>
```

Description

Applies an ACL to the specified VRF.

The **no** form of this command removes application of the ACL from the specified VRF.

Parameter	Description
`ip|ipv6`	Specifies the ACL type: `ip` for IPv4, or`ipv6` for IPv6.
`<ACL-NAME>`	Specifies the ACL name.
`vrf` *`<VRF-NAME>`*	Specifies the VRF name.

Usage

Only one ACL per type (**ip**, or **ipv6**) may be applied to a Control Plane VRF at a time. Therefore, using the **apply access-list control-plane** command on a VRF with an already-applied ACL of the same type, will replace the applied ACL.

Examples

Applying **My_ip_ACL** to Control Plane traffic on the default VRF:

```
switch(config)# apply access-list ip My_ip_ACL control-plane vrf default
```

Replacing My_ip_ACL with **My_Replacement_ACL** on the default VRF:

```
switch(config)# apply access-list ip My_Replacement_ACL control-plane vrf default
```

Remove (unapply) the **My_Replacement_ACL** from the default VRF. Any other interfaces or VLANs with My_Replacement_ACL applied are unaffected.

```
switch(config)# no apply access-list ip My_Replacement_ACL control-plane vrf
default
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

apply access-list (to interface or LAG)

```
no apply access-list {ip | ipv6 | mac} <ACL-NAME> {in | out}
```

Description

Applies an ACL to the interface (Individual front plane port) or Link Aggregation Group (LAG) identified by the current interface or LAG context.

The **no** form of this command removes application of the ACL from the current interface or LAG identified by the current interface or LAG context.

Parameter	Description
`ip|ipv6|mac`	Specifies the ACL type: `ip` for IPv4, `ipv6` for IPv6, or `mac` for MAC ACL.
`<ACL-NAME>`	Specifies the ACL name.
in	Selects the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction.

Usage

- Each ACL of a given type can be applied to the same interface or LAG once in each direction. Therefore, using the **apply access-list** command on an interface or LAG with an already-applied ACL of the same typewill replace the currently applied ACL.
- An ACL can be applied to an individual front plane port or to a Link Aggregation Group (LAG).
- A port that is a member of a LAG with an applied ACL cannot have a different ACL applied to that member port.
- When the port membership of a LAG with an applied ACL is changed, the LAG ACL is automatically applied or removed from that port depending on the modification type.

Examples

On the 6400 Switch Series, interface identification differs.

Applying **My_IP_ACL** to ingress traffic on interface range 1/1/10 to 1/1/12:

```
switch(config)# int 1/1/10-1/1/12
switch((config-if-<1/1/10-1/1/12>)# apply access-list ip My_IP_ACL in
switch((config-if-<1/1/10-1/1/12>)# exit
```

Applying **MY_IP_ACL** to ingress traffic on LAG 100 and egress traffic on interface 1/1/2:

```
switch(config)# interface lag 100
switch(config-lag-if)# apply access-list ip MY_IP_ACL in
switch(config-lag-if)# exit

switch(config)# interface 1/1/2
switch(config-if)# apply access-list ip MY_IP_ACL out
switch(config-if)# exit
switch(config)#
```

Applying **MY_IPV6_ACL** to ingress traffic on interface 1/1/1 and to ingress traffic on LAG 100:

```
switch(config)# interface 1/1/1
switch(config-if)# apply access-list ipv6 MY_IPV6_ACL in
switch(config-if)# exit

switch(config)# interface lag 100
switch(config-lag-if)# apply access-list ipv6 MY_IPV6_ACL in
switch(config-lag-if)# exit
switch(config)#
```

Applying **MY_MAC_ACL** to ingress traffic on interface 1/1/1 and ingress traffic on interface 1/1/2:

```
switch(config)# interface 1/1/1
switch(config-if)# apply access-list mac MY_MAC_ACL in
switch(config-if)# exit

switch(config)# interface 1/1/2
switch(config-if)# apply access-list mac MY_MAC_ACL in
switch(config-if)# exit
switch(config)#
```

Replacing **MY_IP_ACL** with **MY_REPLACEMENT_ACL** on interface 1/1/2:

```
switch(config)# interface 1/1/2
switch(config-if)# apply access-list ip MY_REPLACEMENT_ACL out
switch(config-if)# exit
switch(config)#
```

Unapplying **MY_REPLACEMENT_ACL** from interface 1/1/2 (out):

```
switch(config)# interface 1/1/2
switch(config-if)# no apply access-list ip MY_REPLACEMENT_ACL out
switch(config-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

apply access-list (to interface VLAN)

```
apply access-list {ip|ipv6} <ACL-NAME> {routed-in|routed-out}
no apply access-list {ip|ipv6} <ACL-NAME> {routed-in|routed-out}
```

Description

Applies an ACL to the interface VLAN (or range of interface VLANs) identified by the current interface VLAN context. Using the apply access-list command on an interface VLAN interface with an already-applied ACL of the same direction and type will replace the currently-applied ACL.

The **no** form of this command removes application of the ACL from the interface VLAN (or range of interface VLANs) identified by the current interface VLAN context.

Parameter	Description
`ip|ipv6`	Specifies the ACL type: **ip** for IPv4, **ipv6** for IPv6.
`<ACL-NAME>`	Specifies the ACL name.
`routed-in`	Selects the routed inbound (routed ingress) traffic direction.

Parameter	Description
`routed-out`	Selects the routed outbound (routed egress) traffic direction.

Usage

- Each ACL of a given type can be applied to the same interface VLAN once in each direction. Therefore, using the **apply access-list** command on an interface VLAN with an already-applied ACL of the same direction and type, will replace the applied ACL.
- Applicable to the 6300 and 6400 Switch Series: When an ACL is applied to an interface VLAN, it will create hardware entries on all stack members (6300 switch) and line cards (6400 switch) regardless of whether an interface VLAN member exists on any specific stack member or line card.

Examples

Creating an IPv4 ACL and applying it to routed ingress traffic on interface VLAN vlan100:

```
switch(config)# access-list ip test
switch(config-acl-ip)# 10 permit any 1.1.1.2 2.2.2.2 count
switch(config-acl-ip)# 20 permit any 1.1.1.2 2.2.2.1 count
switch(config-acl-ip)# 30 permit any 2.2.2.2 1.1.1.2 count
switch(config-acl-ip)# 40 permit any 2.2.2.2 1.1.1.1 count
switch(config-acl-ip)# 50 permit any any any count
switch(config-acl-ip)# exit
switch(config)#
switch(config)# interface vlan100
switch(config-if-vlan)# apply access-list ip test routed-in
```

Applying My_ip_ACL to routed ingress traffic on interface VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# apply access-list ip My_ip_ACL routed-in
```

Applying My_ipv6_ACL to routed ingress traffic on interface VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# apply access-list ipv6 My_ip_ACL routed-in
```

Applying My_ip_ACL to routed ingress traffic on interface VLANs 20 to 25:

```
switch(config)# interface vlan 20-25
switch(config-if-vlan-<20-25>)# apply access-list ip My_ip_ACL routed-in
```

Replacing My_ipv6_ACL with My_Replacement_ACL on interface VLAN 10 (following the above examples):

```
switch(config)# interface vlan 10
switch(config-if-vlan)# apply access-list ipv6 My_Replacement_ACL routed-in
```

Removing (unapplying) My_Replacement_ACL on interface VLAN 10. Any other interfaces or VLANs with My_Replacement_ACL applied are not affected:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no apply access-list ipv6 My_Replacement_ACL routed-in
```

Removing (unapplying) My_ip_ACL on interface VLANs 20 to 25. Any other interfaces or VLANs with My_ip_ACL applied are not affected:

```
switch(config)# interface vlan 20-25
switch(config-if-vlan-<20-25>)# no apply access-list ip My_ip_ACL routed-in
```

Applying My_ip_ACL to routed egress traffic on interface VLAN 30:

```
switch(config)# interface vlan 30
switch(config-if-vlan)# apply access-list ip My_ip_ACL routed-out
```

Applying My_ip_ACL to routed egress traffic on interface VLANs 40 to 50:

```
switch(config)# interface vlan 40-50
switch(config-if-vlan-<40-50>)# apply access-list ip My_ip_ACL routed-out
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

apply access-list (to subinterface)

```
apply access-list {ip|ipv6|mac} <ACL-NAME> {in|out}
no apply access-list {ip|ipv6|mac} <ACL-NAME> {in|out}
```

Description

Applies an ACL to the current port or LAG subinterface context or subinterface context range.

The **no** form of this command removes application of the ACL from the current port or LAG subinterface context or subinterface context range.

An ACL cannot be applied to the parent interface of one or more subinterfaces. This also means that a subinterface cannot be added to an interface if there is an ACL applied.

ACE VLAN IDs cannot be added to ACLs applied to subinterfaces. This also means that an ACL with an ACE matching on a VLAN ID cannot be applied to a subinterface.

Parameter	Description
`ip|ipv6|mac`	Specifies the ACL type: **ip** for IPv4, **ipv6** for IPv6, or **mac** for MAC ACL.
<ACL-NAME>	Specifies the ACL name.
`in|out`	Selects the traffic direction.

Usage

- Each ACL of a given type can be applied to the same subinterface once in each direction. Therefore, using the `apply access-list` command on a subinterface with an already-applied ACL of the same type and direction will replace the currently applied ACL.
- In the case of a failed ACL application to a subinterface during switch reboot or hotswap, the subinterface will be shut down. Fixing the failure will cause the subinterface to come back up.
- In the case of a failed ACL application to an added subinterface LAG member(s), the entire LAG subinterface will be shut down. Fixing the failure will cause the LAG subinterface to come back up. For this case to occur, the ACL must already be successfully applied to existing subinterface LAG members. This is done to prevent traffic from circumventing the ACL by passing through new LAG members where the ACL was not successfully applied. This only occurs when the LAG spans more than one line card or stack member.

Examples

On the 6400 Switch Series, interface identification differs.

Applying My_ip_ACL to ingress traffic on subinterface 1/1/1.10:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# apply access-list ip My_ip_ACL in
```

Applying My_ip_ACL_egr to egress traffic on subinterface 1/1/2.8:

```
switch(config)# interface 1/1/2.8
switch(config-subif)# apply access-list ip My_ip_ACL_egr out
```

Applying My_ipv6_ACL to ingress traffic on subinterface 1/1/1.10:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# apply access-list ipv6 My_ipv6_ACL in
```

Applying My_ip_ACL to ingress traffic on subinterface range 1/1/1.11 to 1/1/1.15:

```
switch(config)# interface 1/1/1.11-1/1/1.15
switch(config-subif-<1/1/1.11-1/1/1.15>)# apply access-list ip My_ip_ACL in
```

Replacing My_ipv6_ACL with My_Replacement_ACL on subinterface 1/1/1.10 (following the above examples):

```
switch(config)# interface 1/1/1.10
switch(config-subif)# apply access-list ipv6 My_Replacement_ACL in
```

Removing (unapplying) My_Replacement_ACL on subinterface 1/1/1.10. Any other interfaces or VLANs with My_Replacement_ACL applied are not affected.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# no apply access-list ipv6 My_Replacement_ACL in
```

Removing (unapplying) My_ip_ACL on subinterface 1/1/1.11 to 1/1/1.15. Any other interfaces or VLANs with My_ip_ACL applied are not affected.

```
switch(config)# interface 1/1/1.11-1/1/1.15
switch(config-subif-<1/1/1.11-1/1/1.15>)# no apply access-list ip My_ip_ACL in
```

Applying My_ip_ACL to ingress traffic on subinterface lag1.10:

```
switch(config)# interface lag1.10
switch(config-subif)# apply access-list ip My_ip_ACL in
```

Removing (unapplying) My_ip_ACL from subinterface lag1.10:

```
switch(config)# interface lag1.10
switch(config-subif)# no apply access-list ip My_ip_ACL in
```

Applying My_ip_ACL_egr to egress traffic on subinterface lag1.4:

```
switch(config)# interface lag1.4
switch(config-subif)# apply access-list ip My_ip_ACL_egr out apply access-list ip
My_ip_ACL_egr out
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.10	Added subinterface egress support for interfaces and LAGs.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-subif`	Administrators or local user group members with execution rights for this command.

apply access-list (to L3 VNI)

```
apply access-list {ip|ipv6} <ACL-NAME> {routed-in}
no apply access-list {ip|ipv6} <ACL-NAME> {routed-in}
```

Description

Applies an ACL to the current L3 VNI. Only one direction (`routed-in`) and one type (IPv4/IPv6) of an ACL may be applied to an L3 VNI at a time, thus the `apply` command on an L3 VNI with an already applied ACL of the same direction and type will replace the currently-applied ACL.

The **no** form of this command removes application of the ACL from the L3 VNI identified by the current L3 VNI context.

Parameter	Description
`ip|ipv6`	Specifies the ACL type: **ip** for IPv4 or **ipv6** for IPv6.
`<ACL-NAME>`	Specifies the ACL name.
`routed-in`	Selects the routed-inbound (routed ingress) traffic direction.

Usage

- Each ACL of a given type can be applied to the same L3 VNI interface once in each direction. Therefore, using the **apply access-list** command on an L3 VNI interface with an already-applied ACL of the same type, will replace the applied ACL.
- Applicable to the 6300 and 6400 Switch Series: When an ACL is applied to an L3 VNI interface, it will create hardware entries on all stack members (6300 switch) and line cards (6400 switch) regardless of whether an L3 VNI interface member exists on any specific stack member or line card.

Examples

Applying My_ip_ACL to routed ingress traffic on VNI 10:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 10
switch(config-vni-10)# vrf red
switch(config-vni-10)# routing
switch(config-vni-10)# apply access-list ip My_ip_ACL routed-in
switch(config-vni-10)# exit
switch(config-vxlan-if)# exit
switch(config)#
```

Applying My_ipv6_ACL to routed ingress traffic on VNI 10:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 10
switch(config-vni-10)# vrf red
switch(config-vni-10)# routing
switch(config-vni-10)# apply access-list ipv6 My_ipv6_ACL routed-in
switch(config-vni-10)# exit
switch(config-vxlan-if)# exit
switch(config)#
```

Replacing My_ipv6_ACL with My_Replacement_ACL on VNI 10 (following the preceding examples):

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 10
switch(config-vni-10)# apply access-list ipv6 My_Replacement_ACL routed-in
switch(config-vni-10)# exit
switch(config-vxlan-if)# exit
switch(config)#
```

Removing My_Replacement_ACL on interface VNI 10. Any other interfaces, VLANs, or VNIs with My_ip_ACL applied are not affected:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 10
switch(config-vni-10)# no apply access-list ipv6 My_Replacement_ACL routed-in
switch(config-vni-10)# exit
switch(config-vxlan-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.14	Added support for L3 VNI ACLs.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

apply access-list (to VLAN)

```
apply access-list {ip|ipv6|mac} <ACL-NAME> {in|out}
no apply access-list {ip|ipv6|mac} <ACL-NAME> {in|out}
```

Description

Applies an ACL to the VLAN identified by the current VLAN context.

The **no** form of this command removes application of the ACL from the VLAN identified by the current VLAN context.

Parameter	Description
`ip|ipv6|mac`	Specifies the ACL type: **ip** for IPv4, **ipv6** for IPv6, or **mac** for MAC ACL.
<ACL-NAME>	Specifies the ACL name.
`in`	Selects the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction. **NOTE:** For 6000 and 6100 switch series, the outbound (egress) traffic direction is supported only for MAC ACLs.

Usage

- Each ACL of a given type can be applied to the same VLAN once in each direction. Therefore, using the **apply access-list** command on a VLAN with an already-applied ACL of the same type, will replace the applied ACL.
- Applicable to the 6300 and 6400 Switch Series: When an ACL is applied to a VLAN, it will create hardware entries on all stack members (6300 switch) and line cards (6400 switch) regardless of whether a VLAN member exists on any specific stack member or line card.

Examples

Applying My_ip_ACL to ingress traffic on VLAN range 20 to 25:

```
switch(config)# vlan 20-25
switch(config-vlan-<20-25>)# apply access-list ip My_ip_ACL in
```

Applying My_ip_ACL to egress traffic on VLAN range 40 to 50:

```
switch(config)# vlan 40-50.
switch(config-vlan-<40-50>)# apply access-list ip My_ip_ACL out
```

Applying My_ip_ACL to ingress traffic on VLAN 10:

```
switch(config)# vlan 10
switch(config-vlan-10)# apply access-list ip My_ip_ACL in
```

Applying My_ipv6_ACL to ingress traffic on VLAN 10:

```
switch(config)# vlan 10
switch(config-vlan-10)# apply access-list ipv6 My_ipv6_ACL in
```

Applying My_mac_ACL to ingress traffic on VLAN 10:

```
switch(config)# vlan 10
switch(config-vlan-10)# apply access-list mac My_mac_ACL in
```

Replacing My_ipv6_ACL with My_Replacement_ACL on VLAN 10 (following the preceding examples):

```
switch(config)# vlan 10
switch(config-vlan-10)# apply access-list ipv6 My_Replacement_ACL in
```

Removing (unapplying, Specifies the ACL type: **ip** for IPv4, **ipv6** for IPv6, or **mac** for MAC ACL.) several ACLs on VLAN 10:

```
switch(config)# vlan 10
switch(config-vlan-10)# no apply access-list ipv6 My_Replacement_ACL in
switch(config-vlan-10)# no apply access-list mac My_mac_ACL in
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

clear access-list hitcounts

```
clear access-list hitcounts { all |  [{ip|ipv6|mac} <ACL-NAME>]
                  [interface <IF-NAME>| vlan <VLAN-ID>] [in|out|routed-in|routed-out] }
```

Description

Clears the hit counts for ACLs with ACEs that include the `count` keyword.

Parameter	Description
`all`	Selects all ACLs.
`ip|ipv6|mac`	Specifies the ACL type: `ip` for IPv4, `ipv6` for IPv6, or `mac` for MAC.
`<ACL-NAME>`	Specifies the ACL name.
`interface` *`<IF-NAME>`*	Specifies the interface name (port or LAG). For ingress ACLs you may optionally include a **subinterface ID <SUB-INT>** in the range 1 to 4094 in the form **<IF-NAME>.<SUB-INT>**, for example **1/1/4.1**.
`vlan` *`<VLAN-ID>`*	Specifies the VLAN.
`in`	Selects the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction.
`routed-in|routed-out`	Selects the routed traffic direction on which the ACL is applied. **NOTE:** This is only available for IPv4 and IPv6 ACLs applied to interface VLANs. ▪ **routed-in** selects the routed inbound (routed ingress) traffic direction. ▪ **routed-out** selects the routed outbound (routed egress) traffic direction.

Examples

On the 6400 Switch Series, interface identification differs.

Clearing the hit counts for My_ip_ACL applied to port 1/1/2 (egress):

```
switch# clear access-list hitcounts ip My_ip_ACL interface 1/1/2 out
```

Clearing the hit counts for My_ip_ACL applied to VLAN 10 (ingress):

```
switch# clear access-list hitcounts ip My_ip_ACL vlan 10 in
```

Clearing the hit counts for My_ip_ACL applied to subinterface 1/1/4.1 (ingress):

```
switch# clear access-list hitcounts ip My_ip_ACL interface 1/1/4.1 in
```

Clearing the hit counts for all ACLs:

```
switch# clear access-list hitcounts all
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.08	Added subinterface information.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear access-list hitcounts control-plane

```
clear access-list hitcounts [{ip|ipv6} <ACL-NAME>] control-plane vrf <VRF-NAME>
```

Description

Clears the hit counts for ACLs applied to the Control Plane VRF.

Parameter	Description
ip|ipv6	Specifies the ACL type: **ip** for IPv4, or **ipv6** for IPv6.
<ACL-NAME>	Specifies the ACL name.
vrf *<VRF-NAME>*	Specifies the VRF name.

Examples

Clearing the hit counts for an IPv4 ACL applied to the Control Plane `default` VRF:

```
switch# clear access-list hitcounts ip My_ipv4_ACL control-plane vrf default
```

Clearing the hit counts for an IPv6 ACL applied to the Control Plane `default` VRF:

```
switch# clear access-list hitcounts ipv6 My_ipv6_ACL control-plane vrf default
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

object-group address resequence

`object-group {ip|ipv6} address <OBJECT-GROUP-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`

Description

Reorders the sequence numbers in an address object group.

Parameter	Description
`ip|ipv6`	Specifies the object group IP address type, either `ip` or `ipv6`.
<OBJECT-GROUP-NAME>	Specifies the address object group name.
<STARTING-SEQUENCE-NUMBER>	Specifies the starting sequence number.
<INCREMENT>	Specifies the sequence number increment.

Examples

Resequencing address object group my_ipv4_addr_group to use sequence numbers 5, 10, 15 and so on:

```
switch(config)# object-group address my_ipv4_addr_group resequence 5 5
switch(config)#
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

object-group address reset

`object-group {ip|ipv6} address <OBJECT-GROUP-NAME> reset`

Description

Resets the user configuration back to the active configuration. This command takes immediate effect, it is not saved in the user configuration. Use this command if misconfiguration of an address object group has occurred.

Parameter	Description
`ip|ipv6`	Specifies the object group IP address type, either `ip` or `ipv6`.
`<OBJECT-GROUP-NAME>`	Specifies the address object group name.

Examples

Resetting IPv4 address object group my_ipv4_group:

```
switch(config)# object-group ip address my_ip_group reset
switch(config)#
```

Resetting IPv6 address object group my_ipv6_group:

```
switch(config)# object-group ipv6 address my_ipv6_group reset
switch(config)#
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

object-group all reset

`object-group all reset`

Description

Resets the user configuration back to the active configuration for all object types (address and port). This command takes immediate effect, it is not saved in the user configuration. Use this command if misconfiguration of address object groups and port object groups has occurred. Individual address and port object groups can be reset respectively with the **object-group address reset** and **object-group port** reset commands.

Examples

Resetting the user configuration for all object types (address and port):

```
switch(config)# object-group all reset
switch(config)#
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

object-group ip address

Syntax to create an IPv4 address object group and enter its context:

```
object-group ip address <OBJECT-GROUP-NAME>
no object-group ip address <OBJECT-GROUP-NAME>
```

Syntax (within the address object-group context) for creating or removing IPv4 address entries :

```
[<SEQUENCE-NUMBER>]  <IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]

  no <SEQUENCE-NUMBER>
```

Description

Creates an IPv4 address object group comprised of one or more address entries. Address groups are used solely as a shorthand way of specifying groups of addresses in the ACEs that make up ACLs. IPv4 address groups can be used only in the **access-list ip** command. Entering **object-group ip address** with an existing address group name, enables you to modify an existing address group.

The **no** form of this command deletes the entire address group or deletes a particular address group entry identified by sequence number.

Parameter	Description
<OBJECT-GROUP-NAME>	Specifies the address object group name.
<SEQUENCE-NUMBER>	Specifies a sequence number for the address entry. Range: 1 to 4294967295. When omitted, a sequence number 10 larger than the current highest sequence number is auto-assigned. Default auto-assigned sequence numbers are 10, 20, 30, and so on.
<IP-ADDRESS>[/{*<PREFIX-LENGTH>*|*<SUBNET-MASK>*}]	Specifies the IPv4 address. ■ ***<IP-ADDRESS>*** - specifies the IPv4 host address. ■ ***<PREFIX-LENGTH>*** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 32. ■ ***<SUBNET-MASK>*** - specifies the address bits to mask (dotted decimal notation).

Examples

Creating an IPv4 address group with two entries:

```
switch(config)# object-group ip address my_ipv4_addr_group
switch(config-addrgroup-ip)# 10 192.168.0.1
switch(config-addrgroup-ip)# 20 192.168.0.2
switch(config-addrgroup-ip)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv4       my_ipv4_addr_group
        10 192.168.0.1
        20 192.168.0.2
```

Adding an entry to an existing IPv4 address group:

```
switch(config)# object-group ip address my_ipv4_addr_group
switch(config-addrgroup-ip)# 30 192.168.0.3
switch(config-addrgroup-ip)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv4       my_ipv4_addr_group
        10 192.168.0.1
        20 192.168.0.2
        30 192.168.0.3
```

Removing an entry (20) from an existing IPv4 address group:

```
switch(config)# object-group ip address my_ipv4_addr_group
switch(config-addrgroup-ip)# no 20
switch(config-addrgroup-ip)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv4       my_ipv4_addr_group
        10 192.168.0.1
        30 192.168.0.3
```

Removing an IPv4 address group:

```
switch(config)# no object-group ip address my_ipv4_addr_group
switch(config)# show object-group
No object group found.
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The **object-group ip address** command takes you into the named address group context (with prompt **switch (config-addrgroup-ip)#**) where you enter the addresses.	Administrators or local user group members with execution rights for this command.

object-group ipv6 address

Syntax to create an IPv6 address object group and enter its context:

```
object-group ipv6 address <OBJECT-GROUP-NAME>
no object-group ipv6 address <OBJECT-GROUP-NAME>
```

Syntax (within the address object-group context) for creating or removing IPv6 address entries :

```
  [<SEQUENCE-NUMBER>]  <IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]

  no <SEQUENCE-NUMBER>
```

Description

Creates an IPv6 address object group comprised of one or more address entries. Address groups are used solely as a shorthand way of specifying groups of addresses in the ACEs that make up ACLs. IPv6 address groups can be used only in the `access-list ipv6` command. Entering `object-group ipv6 address` with an existing address group name, enables you to modify an existing address group.

The **no** form of this command deletes the entire address group or deletes a particular address group entry identified by sequence number.

Parameter	Description
<OBJECT-GROUP-NAME>	Specifies the address object group name.
<SEQUENCE-NUMBER>	Specifies a sequence number for the address entry. Range: 1 to 4294967295. When omitted, a sequence number 10 larger than the current highest sequence number is auto-assigned. Default auto-assigned sequence numbers are 10, 20, 30, and so on.
*<IP-ADDRESS>***[/{***<PREFIX-LENGTH>***|***<SUBNET-MASK>***}]**	Specifies the IPv6 address. ▪ *<IP-ADDRESS>* - specifies the IPv6 host address. ◦ *<PREFIX-LENGTH>* - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 128. ◦ *<SUBNET-MASK>* - specifies the address bits to mask (dotted decimal notation).

Examples

Creating an IPv6 address group with two entries:

```
switch(config)# object-group ipv6 address my_ipv6_addr_group
switch(config-addrgroup-ipv6)# 10 1000::1
switch(config-addrgroup-ipv6)# 20 1000::2
switch(config-addrgroup-ipv6)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv6       my_ipv6_addr_group
        10 1000::1
        20 1000::2
```

Adding an entry to an existing IPv6 address group:

```
switch(config)# object-group ipv6 address my_ipv6_addr_group
switch(config-addrgroup-ipv6)#
switch(config-addrgroup-ipv6)# 30 1000::3
switch(config-addrgroup-ipv6)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv6       my_ipv6_addr_group
        10 1000::1
        20 1000::2
        30 1000::3
```

Removing an entry (20) from an existing IPv6 address group:

```
switch(config)# object-group ipv6 address my_ipv6_addr_group
switch(config-addrgroup-ipv6)# no 20
switch(config-addrgroup-ipv6)# exit
switch(config)# show object-group
Type        Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv6        my_ipv6_addr_group
        10 1000::1
        30 1000::3
```

Removing an IPv6 address group:

```
switch(config)# no object-group ipv6 address my_ipv6_addr_group
switch(config)# show object-group
No object group found.
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The **object-group ipv6 address** command takes you into the named address group context (with prompt **switch (config-addrgroup-ipv6)#**) where you enter the addresses.	Administrators or local user group members with execution rights for this command.

object-group port

Syntax to create a Layer 4 port object group and enter its context:

```
object-group port <OBJECT-GROUP-NAME>

no object-group port <OBJECT-GROUP-NAME>
```

Syntax (within the port object-group context) for creating or removing Layer 4 port entries:

```
  [<SEQUENCE-NUMBER>] { {eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT> }

  no <SEQUENCE-NUMBER>
```

Description

Creates a Layer 4 port object group comprised of one or more port entries. Port groups are used solely as a shorthand way of specifying groups of ports in the ACEs that make up ACLs. Layer 4 port groups can be used only in the **access-list ip** and **access-list ipv6** commands. Entering **object-group port** with an existing port group name, enables you to modify an existing port group.

The **no** form of this command deletes the entire port group or deletes a particular port group entry identified by sequence number.

Parameter	Description
<OBJECT-GROUP-NAME>	Specifies the port object group name.
<SEQUENCE-NUMBER>	Specifies a sequence number for the port entry. Range: 1 to 4294967295. When omitted, a sequence number 10 larger than the current highest sequence number is auto-assigned. Default auto-assigned sequence numbers are 10, 20, 30, and so on.
{ {eq|gt|lt} *<PORT>***|range** *<MIN-PORT><MAX-PORT>* **}**	Specifies the port or port range. Port numbers are in the range of 0 to 65535. ■ **eq *<PORT>*** - specifies the Layer 4 port. ■ **gt *<PORT>*** - specifies any Layer 4 port greater than the indicated port. ■ **lt *<PORT>*** - specifies any Layer 4 port less than the indicated port. ■ **range *MIN-PORT> <MAX-PORT>*** - specifies the Layer 4 port range. **NOTE:** When ACLs using ACEs defined with port groups are applied, the same number of hardware resources are consumed as when the ports are specified directly in the ACEs and not in a group. Keep this in mind when creating port groups that include many ports. Although hardware resource consumption is the same, with or without port groups used, it may not be immediately obvious that some port groups that you have defined, include many ports. It is recommended that you name port groups in a manner that reminds you that a group includes many ports.

Examples

Creating a port group with two entries to cover port 80 plus ports 0 through 50:

```
switch(config)# object-group port my_port_group
switch(config-portgroup)# 10 eq 80
switch(config-portgroup)# 20 range 0 50
switch(config-portgroup)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
Port       my_port_group
        10 eq 80
        20 range 0 50
```

Adding an entry for ports greater than 65525 (covers ports 65526 through 65535):

```
switch(config)# object-group port my_port_group
switch(config-portgroup)# 30 gt 65525
switch(config-portgroup)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
Port       my_port_group
        10 eq 80
        20 range 0 50
        30 gt 65525
```

Removing an entry (#20) from the port group:

```
switch(config)# object-group port my_port_group
switch(config-portgroup)# no 20
switch(config-portgroup)# exit
switch(config)# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
Port       my_port_group
        10 eq 80
        30 gt 65525
```

Removing the port group:

```
switch(config)# no object-group port my_port_group
switch(config)# show object-group
No object group found.
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The **object-group ip port** command takes you into the named port group context (with prompt **switch(config-portgroup)#**) where you specify the ports.	Administrators or local user group members with execution rights for this command.

object-group port resequence

`object-group port <OBJECT-GROUP-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`

Description

Reorders the sequence numbers in a port object group.

Parameter	Description
<OBJECT-GROUP-NAME>	Specifies the port object group name.
<STARTING-SEQUENCE-NUMBER>	Specifies the starting sequence number.
<INCREMENT>	Specifies the sequence number increment.

Examples

Resequencing port object group my_port_group to use sequence numbers 110, 120, 130 and so on:

```
switch(config)# object-group port my_port_group resequence 110 10
switch(config)#
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

object-group port reset

```
object-group port <OBJECT-GROUP-NAME> reset
```

Description

Resets the user configuration back to the active configuration. This command takes immediate effect, it is not saved in the user configuration. Use this command if misconfiguration of a port object group has occurred.

Parameter	Description
<OBJECT-GROUP-NAME>	Specifies the port object group name.

Examples

Resetting port object group my_port_group:

```
switch(config)# object-group port my_port_group reset
switch(config)#
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

show access-list

Syntax that filters by ACLs applied to an interface, VLAN, or VNI:

```
show access-list [interface <IF-NAME>|vlan <VLAN-ID>|vni <VNI-ID>]
                 [in|out|routed-in|routed-out][ip|ipv6|mac] [<acl-name>][commands] [configuration]
show access-list [ip|ipv6] [<ACL-NAME>] control-plane [vrf <VRF-NAME>] [commands]
[configuration]
```

Syntax that filters by the named ACL:

```
show access-list [ip|ipv6|mac] [<ACL-NAME>] [commands] [configuration] [vsx-peer]
```

Description

Shows information about your defined ACLs and where they have been applied. When **show access-list** is entered without parameters, information for all ACLs is shown. The parameters filter the list of ACLs for which information is shown.

Available filtering includes:

- The content of a specific ACL.
- All ACLs of a specific type.
- The ACL applied in a particular direction.
- The ACL applied to a specific interface (port or split port or LAG).
- The ACL applied to a specific subinterface (port or LAG).
- The ACL applied to a specific VLAN.
- The ACL applied to a specific VNI.
- The ACL applied to specific interface VLAN (routed-in or routed-out).
- The control-plane ACL applied to a specific VRF.

Parameter	Description
`interface <IF-NAME>`	Specifies the interface name (port or LAG). For ingress ACLs you may optionally include a subinterface ID `<SUB-INT>` in the range 1 to 4094 in the form `<IF-NAME>.<SUB-INT>`, for example `1/1/4.1`.
`vlan <VLAN-ID>`	Specifies the VLAN.
`vni <VNI-ID>`	Specifies the ID of the VNI.
`control-plane vrf <VRF-NAME>`	Specifies the VRF of the control plane ACL.
`ip|ipv6|mac`	Specifies the ACL type: ■ **ip** for IPv4, ■ **ipv6** for IPv6, or ■ **mac** for MAC.
`in`	Selects the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction.
`routed-in`	Selects the routed inbound (routed ingress) traffic direction. **NOTE**: This is only available for IPv4 and IPv6 ACLs applied to interface VLANs.
`routed-out`	Selects the routed outbound (routed egress) traffic direction. **NOTE**: This is only available for IPv4 and IPv6 ACLs applied to interface VLANs.
`<ACL-NAME>`	Specifies the ACL name.
`commands`	Specifies that the ACL definition is to be shown as the commands and parameters used to create it rather than in tabular form.
`configuration`	Specifies that the user-configured ACLs be shown as entered, even if the ACLs are not active due to ACE-definition command issues or hardware issues. This parameter is useful if there is a mismatch between the entered configuration and the previous successfully programmed (active) ACLs configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Creating an IPv4 ACL, applying it to an interface VLAN (routed in), and then showing ACL information filtered for that interface VAN:

```
switch(config)# access-list ip test
switch(config-acl-ip)# 10 permit any 1.1.1.2 2.2.2.2 count
switch(config-acl-ip)# 20 permit any 1.1.1.2 2.2.2.1 count
switch(config-acl-ip)# 30 permit any 2.2.2.2 1.1.1.2 count
switch(config-acl-ip)# 40 permit any 2.2.2.2 1.1.1.1 count
switch(config-acl-ip)# 50 permit any any any count
switch(config-acl-ip)# exit
switch(config)#
switch(config)# interface vlan100
switch(config-if-vlan)# apply access-list ip test routed-in
switch(config-if-vlan)# exit
switch(config)# show access-list interface vlan100 ip routed-in

Direction
Type       Name
  Sequence Comment
           Ac  L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
Routed Inbound
IPv4       test
        10
           permit                          any
           1.1.1.2
           2.2.2.2
           Hit-counts: enabled
        20
           permit                          any
           1.1.1.2
           2.2.2.1
           Hit-counts: enabled
        30
           permit                          any
           2.2.2.2
           1.1.1.2
           Hit-counts: enabled
        40
           permit                          any
           2.2.2.2
           1.1.1.1
           Hit-counts: enabled
        50
           permit                          any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
```

Showing an IPv4 ACL:

```
switch# show access-list ip MY_ACL
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0          >  1023
           any
        30 permit                          tcp
           172.26.1.0//255.255.255.0
           any
           syn
           ack
           dscp 10
        40 deny                            any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
```

Showing an IPv4 ACL as commands:

```
switch# show access-list ip MY_ACL commands
access-list ip MY_ACL
    10 permit udp any 172.16.1.0/255.255.255.0
    20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any
    30 permit tcp 172.26.1.0/255.255.255.0 any syn ack dscp 10
    40 deny any any any count
```

Showing a MAC ACL applied to subinterface 1/1/2.1, inbound:

```
switch# show access-list interface 1/1/2.1 mac in
Direction
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
Inbound
MAC        My_mac_ACL
        10
           permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20
           permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30
           deny                            any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
```

Showing IPv4 ACLs applied to VLAN 10, inbound:

```
switch# show access-list vlan 10 ip in
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
------------------------------------------------------------------------------
IPv4       My_ip_ACL
        10 permit                          udp
           any
           172.16.1.0/255.255.255.0
        20 permit                          tcp
           172.16.2.0/255.255.0.0          >  1023
           any
        30 permit                          tcp
           172.26.1.0//255.255.255.0
           any
           syn
           ack
           dscp 10
        40 deny                            any
           any
           any
           Hit-counts: enabled
------------------------------------------------------------------------------
```

Showing IPv6 ACLs applied to LAG 128, inbound:

```
switch# show access-list interface lag128 ipv6 in
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
------------------------------------------------------------------------------
IPv6       MY_IPV6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 permit                          tcp
           2001:2001::2:1/128               >  1023
           any
        30 permit                          tcp
           2001:2011::1/64
        40 deny                            any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
```

Showing an IPv6 ACL as commands:

```
switch# show access-list ipv6 MY_IPV6_ACL commands
access-list ipv6 MY_IPV6_ACL
    10 permit udp any 2001::1/64
    20 permit tcp 2001:2001::2:1/128 gt 1023 any
    40 deny any any any count
```

Showing a MAC ACL:

```
switch# show access-list mac MY_MAC_ACL
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_ACL
        10 permit                          ipv6
           1122.3344.5566/ffff.ffff.0000
           any
        20 permit                          any
           aaaa.bbbb.cccc
           1111.2222.3333
           QoS Priority Code Point: 4
        30 deny                            any
           any
           any
           Hit-counts: enabled
-------------------------------------------------------------------------------
```

Showing a MAC ACL as commands:

```
switch# show access-list mac MY_MAC_ACL commands
access-list mac MY_MAC_ACL
    10 permit 1122.3344.5566/ffff.ffff.0000 any ipv6
    20 permit aaaa.bbbb.cccc 1111.2222.3333 any pcp 4
    30 deny any any any count
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.14	Added support for L3VNI ACLs.

Release	Modification
10.08	Added subinterface information and examples.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show access-list control-plane

```
show access-list [ip|ipv6] [<ACL-NAME>] control-plane [vrf <VRF-NAME>]
                 [commands] [configuration][vsx-peer]
```

Description

Shows information about your defined ACLs that have been applied to the Control Plane. When **show access-list control-plane** is entered without parameters, information for all ACLs applied to the Control Plane is shown. The parameters filter the list of ACLs for which information is shown.

Available filtering includes:

- The content of a specific ACL that has been applied to the Control Plane.
- All ACLs of a specific type that have been applied to the Control Plane.
- All ACLs applied to the Control Plane for a specific VRF.

Parameter	Description
`ip|ipv6`	Specifies the ACL type: `ip` for IPv4, or`ipv6` for IPv6.
<ACL-NAME>	Specifies the ACL name.
`vrf` *<VRF-NAME>*	Specifies the VRF name.
`[commands]`	Specifies that the ACL definition is to be shown as the commands and parameters used to create it rather than in tabular form.
`[configuration]`	Specifies that the user-configured ACLs be shown as entered, even if the ACLs are not active due to ACE-definition command issues or hardware issues. This parameter is useful if there is a mismatch between the entered configuration and the previous successfully programmed (active) ACLs configuration.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing an IPv4 ACL applied to the Control Plane `default` VRF:

```
switch# show access-list ip My_ipv4_ACL control-plane vrf default
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
------------------------------------------------------------------------------
IPv4       My_ipv4_ACL
        10 permit                          udp
           any
           172.16.1.0/24
        20 permit                          tcp
           172.16.2.0/16                    >  1023
           any
        30 permit                          tcp
           172.26.1.0/24
           any
           syn
           ack
           dscp 10
        40 deny                            any
           any
           any
           Hit-counts: enabled
------------------------------------------------------------------------------
```

Showing an IPv6 ACL applied to the Control Plane `default` VRF:

```
switch# show access-list ipv6 My_ipv6_ACL control-plane vrf default
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
------------------------------------------------------------------------------
IPv6       My_ipv6_ACL
        10 permit                          udp
           any
           2001::1/64
        20 permit                          tcp
           2001:2001::2:1/128               >  1023
           any
        30 permit                          tcp
           2001:2011::1/64
        40 deny                            any
           any
           any
           Hit-counts: enabled
------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show access-list hitcounts

```
show access-list hitcounts { [{ip|ipv6|mac} <ACL-NAME>] [interface <IF-NAME> |
                 vlan <VLAN-ID>] [in|out|routed-in|routed-out] [vsx-peer] }
show access-list hitcounts { [{ip|ipv6|mac} <ACL-NAME>] [interface <IF-NAME>|
vlan <VLAN-ID>|vni <VNI-ID>] [in|out|routed-in|routed-out]} [vsx-peer] }
show access-list hitcounts [{ip|ipv6} <acl-name>] control-plane vrf <VRF-NAME>
```

Description

Shows the hit count of the number of times an ACL has matched a packet or frame for ACEs with the **count** keyword. For ACEs without the **count** keyword, a dash is shown in place of a hit count.

Parameter	Description
`ip|ipv6|mac`	Specifies the ACL type: **ip** for IPv4, **ipv6** for IPv6, or **mac** for MAC.
<ACL-NAME>	Specifies the ACL name.
`interface` *<IF-NAME>*	Specifies the interface name (port or split port or LAG). For ingress ACLs you may optionally include a subinterface ID **<SUB-INT>** in the range 1 to 4094 in the form **<IF-NAME>.<SUB-INT>**, for example **1/1/4.1**.
`vlan` *<VLAN-ID>*	Specifies the VLAN.
`vni` *<VNI-ID>*	Specifies the ID of the VNI.
`control-plane vrf` *<VRF-NAME>*	Specifies the VRF of the control plane ACL.
`in`	Selects the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction.
`routed-in`	Selects the routed inbound (routed ingress) traffic direction.
`routed-out`	Selects the routed outbound (routed egress) traffic direction.

Usage

- ACL hit counts are aggregated across all:
  - Physical interfaces to which the ACL is applied to on ingress.
  - Physical interfaces to which the ACL is applied to on egress.
  - VLANs to which the ACL is applied to on ingress.
  - VLANs to which the ACL is applied to on egress.
  - Interface VLANs to which the IPv4 or IPv6 ACL is applied on routed ingress.
  - Interface VLANs to which the IPv4 or IPv6 ACL is applied on routed egress.
  - L3 VNI ACLs with interface VLANs applied on routed ingress.
- If an ACL with an ACE with the **count** keyword is applied to multiple physical interfaces or VLANs, the hit counts are aggregated. There is one aggregation for physical interfaces and another for VLANs.
- If an ACL with an ACE with the **count** keyword is applied to multiple subinterfaces, the hit counts are aggregated.
- Accumulated hit counts for an applied ACL are cleared upon any modification of the ACL.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the hit counts for **My_ip_ACL** applied to port 1/1/2:

```
switch# show access-list hitcounts ip My_ip_ACL interface 1/1/2
Statistics for ACL My_ip_ACL (ipv4):
interface 1/1/1-1/1/2,lag1 (out):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count
```

Showing the hit counts for **My_ip_ACL** applied to VLAN 10:

```
switch# show access-list hitcounts ip My_ip_ACL vlan 10
Statistics for ACL My_ip_ACL (ipv4):
vlan 10,20-100,300 (in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count
```

Showing the hit counts for ACLs applied to subinterfaces:

```
switch# show access-list hitcounts ip My_ip_ACL interface 1/1/4.1
Statistics for ACL My_ip_ACL (ipv4):
interface 1/1/4.1,1/1/10.10 (in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count

switch# show access-list hitcounts ip My_ip_ACL2 interface lag1.3
```

```
Statistics for ACL My_ip_ACL2 (ipv4):
interface lag1.3-lag1.4 (in):
     Matched Packets  Configuration
                   0  10 deny icmp any 192.168.42.1 count
                3884  100 permit any any any count
                   0  implicit deny any any any count
```

Showing the hit counts for **My_ip_ACL** applied to interface VLAN 10:

```
switch# show access-list hitcounts ip My_ip_ACL vlan 10
Statistics for ACL My_ip_ACL (ipv4):
interface vlan 10,20,30 (routed-in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count
```

Showing the hit counts for My_ip_ACL applied on any interface and direction:

```
switch# show access-list hitcounts ip My_ip_ACL vlan 10
switch# show access-list hitcounts ip My_ip_ACL
Statistics for ACL My_ip_ACL (ipv4):
interface 1/1/1 (in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count



interface 1/1/4.1,1/1/10.10 (in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count



interface vlan 10,20,30 (routed-in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count

interface vlan 80-85 (routed-out):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count

vlan 10,20-100,300 (in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count


vrf blue,default,red (control-plane):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count
```

Showing hit counts for **My_ip_ACL** applied to L3 VNIs.

```
switch# show access-list hitcounts ip My_ip_ACL vni 10
Statistics for ACL My_ip_ACL (ipv4):
vni 10 (routed-in):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count
```

Removing hit counts for **My_ip_ACL** applied on L3 VNIs.

```
switch# clear access-list hitcounts ip My_ip_ACL vni 10 routed-in
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.14	Added support for L3 VNI ACLs.
10.08	Added subinterface information and examples.
10.07 or earlier	Updated command output to use interface and VLAN ranges to reflect aggregation.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show access-list hitcounts control-plane

```
show access-list hitcounts [{ip|ipv6} <ACL-NAME>] control-plane vrf <VRF-NAME> [vsx-peer]
```

Description

Shows the hit count of the number of times an ACL (applied to the Control Plane) has matched a packet for ACEs with the `count` keyword. For ACEs without the `count` keyword, a dash is shown in place of a hit count.

Parameter	Description
`ip|ipv6`	Specifies the ACL type: **ip** for IPv4, or **ipv6** for IPv6.
`<ACL-NAME>`	Specifies the ACL name.
`vrf` *`<VRF-NAME>`*	Specifies the VRF name.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

- ACL hit counts are aggregated across all VRFs to which the ACL is applied to on ingress.
- Accumulated hit counts for an applied ACL are cleared upon any modification of the ACL.

Examples

Showing the hit counts for an IPv4 ACL applied to the Control Plane default VRF:

```
switch# show access-list hitcounts ip My_ipv4_ACL control-plane vrf default
Statistics for ACL My_ip_ACL (ipv4):
vrf default (control-plane):
     Matched Packets  Configuration
                   -  10 permit udp any 172.16.1.0/255.255.255.0
                   0  20 permit tcp 172.16.2.0/255.255.0.0 gt 1023 any count
                   -  30 permit tcp 172.26.1.0/255.255.255.0 any dscp AF11 ack syn
                   0  implicit deny any any any count
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show access-list secure-update

```
show access-list secure-update
```

Description

Use this command to determine if access lists are updated using the secure-update feature. Secure-update is enabled by default.

Examples

Displaying the status of the access list secure-update feature when that feature is enabled:

```
switch(config)# show access-list secure-update
Access-list secure-update is enabled
```

Displaying the status of the access list secure-update feature when that feature is disabled:

```
switch(config)# show access-list secure-update
Access-list secure-update is disabled
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Related Commands

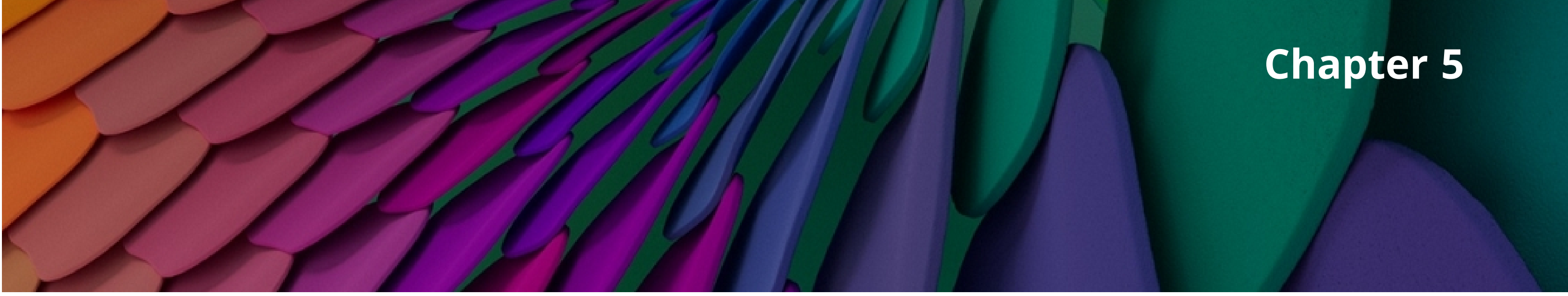
Command	Description
`access-list secure-update`	This command determines if access lists are updated using the secure-update feature. Secure-update is enabled by default.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.



Chapter 5

Aruba Central commands

aruba-central

```
aruba-central
no aruba-central
```

Description

Creates or enters the Aruba Central configuration context (`config-aruba-central`).

Example

Creating the Aruba Central configuration context:

```
switch(config)# aruba-central
switch(config-aruba-central)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

aruba-central support-mode

```
aruba-central support-mode
no aruba-central support-mode
```

Description

Allows the device to be writable for all operations in Aruba Central lockout mode for troubleshooting. The no form of this command disables this activity.

Support-mode is disabled by default when the switch is managed by Aruba Central. This command is only effective in the CLI session where it is executed.

Examples

Configuring the device to be writable for all operations in Aruba Central lockout mode:

```
switch# aruba-central support-mode
switch#
```

Removing the configuration that allows the device to be writable for all operations in Aruba Central lockout mode:

```
switch# no aruba-central support-mode
switch#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

configuration-lockout central managed

```
configuration-lockout central managed
no configuration-lockout central managed
```

Description

Configures the device to only be writable from Aruba Central. Aruba Central will be the only agent that can add, modify, or delete configurations on the device. The no form of this command disables this feature.

The no form of this command is only available when the device is disconnected from Aruba Central.

Usage

The AOS-CX switch connects to Aruba Central in either of two modes: monitor or managed. When the device is connected in monitor mode, Aruba Central monitors the configurations on the switch. When the device is connected in managed mode, the **configuration-lockout central managed** command does not allow configuration changes from other interfaces such as CLI or Web UI.

Examples

Configuring the device to only be writable from Aruba Central :

```
switch(config)# configuration-lockout central managed
switch# show configuration-lockout
configuration lockout
---------------------
central: managed
switch# sh aruba-central
Central admin state                 :enable
Central location                    :20.0.0.2:8083
VRF for connection                  :default
Central connection status           :connected

Central source                      :cli
Central source connection status    :connected
Central source last connected on    :Tue Feb 9 17:53:13 UTC 2021

Activate Server URL                 :devices-v2.arubanetworks.com
CLI location                        :20.0.2:8083
CLI VRF                             :default
switch(config)# end
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables connection to Aruba Central server.

When the connection is disabled, the switch does not attempt to connect to the Aruba Central server or fetch central location from any of the three sources (CLI/Aruba Activate/DHCP). It also disconnects any active connection to the Aruba Central server.

Example

```
switch(config-aruba-central)# disable
switch(config-aruba-central)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-aruba-central`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables connection to Aruba Central server. When the connection is enabled, the switch attempts to download the location of the Aruba Central server in one of the following ways at startup and after the connection is lost:

- Using command-line interface (CLI).
- Connecting to Aruba Activate server.
- Using DHCP options provided during ZTP.

DHCP servers provide the options requested by the device to connect to Central, Central On-premise managment, or the TFTP server.

When a switch is able to connect to Aruba Central, but is not registered in the Aruba Central inventory or does not have a proper license, the switch will get disconnected. If the Aruba Central feature is enabled using this command, the switch will then reconnect back to Aruba Central and will get disconnected again. This connect/disconnect process will continue until the switch is properly registered in Aruba Central. To avoid this unnecessary reconnection cycle, best practices is to disable Aruba Central until the switch is registered in Aruba Central, or a license is obtained for that device.

Examples

```
switch(config-aruba-central)# enable
switch(config-aruba-central)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-aruba-central`	Administrators or local user group members with execution rights for this command.

location-override

```
location-override <location> [vrf <VRF-NAME>]
no location-override
```

Description

When **location** and **vrf** are configured, the switch overrides existing connections to Aruba Central. The switch attempts to establish connection to Aruba Central with the specified location and VRF with highest priority.

Location can take one of the following values:

- A fully qualified domain name (FQDN) along with an optional port number.
- An IPv4 address with an optional port number.
- An IPv6 address with an optional port number.

If the port number is not specified, then port 443 is used by default. If the command is executed without the VRF parameter, the switch uses

the 'default' VRF.

The **no** form of this command removes location override values from the Aruba Central configuration context.

When you configure an IPv6 address with a port number, specify the address part inside square brackets, optionally followed by the port number, e.g. [2001:0db8:85a3:0000:0000:8a2e:0370:7334]:443.

Parameter	Description
<location>	Specifies one of these values: - *<FQDN>*: a fully qualified domain name. - *<IPV4>*: an IPv4 address. - *<IPV6>*: an IPv6 address.
vrf *<VRF-NAME>*	Specifies the VRF name to be used for communicating with the

Parameter	Description
	server. If no VRF name is provided, the default VRF named `default` is used.

Examples

Configuring location override with location and VRF:

```
switch(config-aruba-central)# location-override aruba-central.com vrf default
switch(config-aruba-central)#
switch(config-aruba-central)# location-override aruba-central.com vrf red
switch(config-aruba-central)# location-override 10.0.0.1 vrf red
switch(config-aruba-central)# location-override 10.0.0.1:443 vrf red
switch(config-aruba-central)# location-override
2001:0db8:85a3:0000:0000:8a2e:0370:7334 vrf red
switch(config-aruba-central)# location-override
[2001:0db8:85a3:0000:0000:8a2e:0370:7334]:443 vrf red
```

Configuring location override with location only:

```
switch(config-aruba-central)# location-override aruba-central.com
switch(config-aruba-central)#
```

Removing location override values from the Aruba Central configuration context:

```
switch(config-aruba-central)# no location-override
switch(config-aruba-central)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command updated to reflect OTP scenario..
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-aruba-central`	Administrators or local user group members with execution rights for this command.

location-override-alternative

```
location-override-alternative <LOCATION> [vrf <VRF>]
no location-override-alternative <LOCATION> [vrf <VRF>]
```

Description

Configures information about Aruba Central connection when the alternative location is used.

The **no** form of this command removes the **location-override-alternative** configuration.

Parameter	Description
<LOCATION>	Specifies the Aruba-Central location.
vrf *<VRF>*	Specifies the VRF used to connect to Aruba-Central.

Usage

When the main and alternative Aruba Central server locations are specified, the switch attempts to connect to the main Aruba Central server. If there is connectivity failure with the main Aruba Central server location, it attempts to establish a connection with the alternative server location.

If the alternative location is configured without a main location, the user is prompted for confirmation. In this case, there is no redundancy and the switch attempts to connect to the alternative location.

Location can take one of the following values:

- A fully qualified domain name (FQDN) along with an optional port number.
- An IPv4 address with an optional port number.
- An IPv6 address with an optional port number.

If the port number is not specified, then port 443 is used by default. If the command is executed without the VRF parameter, the switch uses

the 'default' VRF.

An Aruba Central server location can only be a fully qualified domain name (FQDN) or a valid IP address. If the command is entered without the VRF parameter, the switch uses the default VRF.

Examples

Example of configuring with the aruba-central.com location and VRF red:

```
switch(config-aruba-central)# location-override-alternative aruba-central.com vrf
red
switch(config-aruba-central)#
```

Example of a configuration with location only:

```
switch(config-aruba-central)# location-override-alternative aruba-central.com
switch(config-aruba-central)#
```

Example of removing the override configuration:

```
switch(config-aruba-central)# no location-override-alternative
switch(config-aruba-central)# location-override-alternative 10.0.0.1 vrf red
switch(config-aruba-central)# location-override-alternative 10.0.0.1:443 vrf red
switch(config-aruba-central)# location-override-alternative
2001:0db8:85a3:0000:0000:8a2e:0370:7334 vrf red
switch(config-aruba-central)# location-override-alternative
[2001:0db8:85a3:0000:0000:8a2e:0370:7334]:443 vrf red
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command updated to reflect OTP scenario.
10.12.1000	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-aruba-central`	Administrators or local user group members with execution rights for this command.

show aruba-central

```
show aruba-central
```

Description

Shows information about Aruba Central connection and the status of the Activate server connection.

Examples

Example of a switch that has the Aruba Central connection:

```
switch# show aruba-central
Central admin state                     : enabled
Central location                        : 10.0.0.1
VRF for connection                      : mgmt
Shared Token                            : N/A
Central connection status               : connected
Central source                          : activate
Central source connection status        : connected
Central source last connected on        : Wed Jun 28 23:07:25 UTC 2023
Main location                           : 10.0.0.1
Main VRF                                : mgmt
Alternative location                    : N/A
Alternative VRF                         : N/A
Activate Server URL                     : devices-v2.arubanetworks.com
System time synchronized from Activate  : N/A
Source IP                               : N/A
Source IP Overridden                    : False
Central support mode                    : disabled
```

Example of a switch when the main CLI location is used:

```
switch# show aruba-central
Central admin state                    : enabled
Central location                       : 10.0.0.1
```

```
VRF for connection                     : mgmt
Shared secret                          : N/A
Central connection status              : connected
Central source                         : cli
Central source connection status       : connected
Central source last connected on       : Wed Jun 28 23:07:25 UTC 2023
Main location                          : 10.0.0.1
Main VRF                               : mgmt
Alternative location                   : 20.0.0.1
Alternative VRF                        : default
Activate server URL                    : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                              : N/A
Source IP Overridden                   : False
Central support mode                   : disabled
```

Example of a switch when the alternative CLI location is used:

```
switch# show aruba-central
Central admin state                    : enabled
Central location                       : 20.0.0.1
VRF for connection                     : default
Shared secret                          : N/A
Central connection status              : connected
Central source                         : cli
Central source connection status       : connected
Central source last connected on       : Wed Jun 28 23:07:25 UTC 2023
Main location                          : 10.0.0.1
Main VRF                               : mgmt
Alternative location                   : 20.0.0.1
Alternative VRF                        : default
Activate server URL                    : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                              : N/A
Source IP Overridden                   : False
Central support mode                   : disabledswitch# show aruba-central
Central admin state                    : enabled
Central location                       : 20.0.0.1
VRF for connection                     : default
Shared secret                          : N/A
Central connection status              : connected
Central source                         : cli
Central source connection status       : connected
Central source last connected on       : Wed Jun 28 23:07:25 UTC 2023
Main location                          : 10.0.0.1
Main VRF                               : mgmt
Alternative location                   : 20.0.0.1
Alternative VRF                        : default
Activate server URL                    : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                              : N/A
Source IP Overridden                   : False
Central support mode                   : disabled
```

Example of a switch when the location is obtained from DHCP options:

```
switch# show aruba-central
Central admin state                    : enabled
Central location                       : central-western-us.arubanetworks.com
```

```
VRF for connection                      : RED
Shared secret                           : N/A
Central connection status               : connected
Central source                          : DHCP
Central source connection status        : connected
Central source last connected on        : Fri Jun 30 20:22:33 UTC 2023
Main location                           : central-western-us.arubanetworks.com
Main VRF                                : mgmt
Alternative location                    : N/A
Alternative VRF                         : N/A
Activate server URL                     : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                               : 100.0.0.1
Source IP Overridden                    : False
Central support mode                    : disabled
```

Example of a switch when Aruba Central is disabled:

```
switch# show aruba-central
Central admin state                     : disabled
Central location                        : N/A
VRF for connection                      : N/A
Shared secret                           : N/A
Central connection status               : N/A
Central source                          : none
Central source connection status        : N/A
Central source last connected on        : N/A
Main location                           : N/A
Main VRF                                : N/A
Alternative location                    : N/A
Alternative VRF                         : N/A
Activate server URL                     : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                               : N/A
Source IP Overridden                    : False
Central support mode                    : disabledswitch# show aruba-central
Central admin state                     : disabled
Central location                        : N/A
VRF for connection                      : N/A
Shared secret                           : N/A
Central connection status               : N/A
Central source                          : none
Central source connection status        : N/A
Central source last connected on        : N/A
Main location                           : N/A
Main VRF                                : N/A
Alternative location                    : N/A
Alternative VRF                         : N/A
Activate server URL                     : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                               : N/A
Source IP Overridden                    : False
Central support mode                    : disabled
```

Example of a switch when Aruba Central is not reachable:

```
switch# show aruba-central
Central admin state                     : enabled
Central location                        : N/A
```

```
VRF for connection                       : N/A
Shared secret                            : N/A
Central connection status                : not-reachable
Central source                           : activate
Central source connection status         : connected
Central source last connected on         : Fri Jun 30 20:22:33 UTC 2023
Main location                            : N/A
Main VRF                                 : N/A
Alternative location                     : N/A
Alternative VRF                          : N/A
Activate server URL                      : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                                : N/A
Source IP Overridden                     : False
Central support mode                     : disabled
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.12.1000	Enhanced to support more scenarios
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config current-context

```
show running-config current-context
```

Description

Shows the running configuration for the current-context. If user is in the context of Aruba-Central (**config-aruba-central**), then Aruba Central running configuration is displayed.

Examples

Shows the running configuration of Aruba Central:

```
switch(config-aruba-central)# show running-config current-context
aruba-central
       disable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities

```
show capacities <FEATURE> [vsx-peer]
```

Description

Shows system capacities and their values for all features or a specific feature.

Parameter	Description
<FEATURE>	Specifies a feature. For example, **aaa** or **vrrp**.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Capacities are expressed in user-understandable terms. Thus they may not map to a specific hardware or software resource or component. They are not intended to define a feature exhaustively.

Examples

Showing all available capacities for BGP:

```
switch# show capacities bgp

System Capacities: Filter BGP
Capacities Name                                                            Value
---------------------------------------------------------------------------------
-
Maximum number of AS numbers in as-path attribute
32
...
```

Showing all available capacities for mirroring:

```
switch# show capacities mirroring

System Capacities: Filter Mirroring
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of Mirror Sessions configurable in a system
4
Maximum number of enabled Mirror Sessions in a system
4
```

Showing all available capacities for MSTP:

```
switch# show capacities mstp

System Capacities: Filter MSTP
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of mstp instances configurable in a system
64
```

Showing all available capacities for VLAN count:

```
switch# show capacities vlan-count

System Capacities: Filter VLAN Count
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of VLANs supported in the system
4094      /switch# show capacities vlan-count

System Capacities: Filter VLAN Count
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of VLANs supported in the system
4094
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show capacities-status

`show capacities-status <FEATURE> [vsx-peer]`

Description

Shows system capacities status and their values for all features or a specific feature.

Parameter	Description
<FEATURE>	Specifies the feature, for example **aaa** or **vrrp** for which to display capacities, values, and status. Required.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing the system capacities status for all features:

```
                 switch# show capacities-status

System Capacities Status
Capacities Status Name                                                      Value
Maximum
----------------------------------------------------------------------------------
-------
Number of active gateway mac addresses in a system                              0
    16
Number of aspath-lists configured                                               0
    64
Number of community-lists configured                                            0
    64
...
```

Showing the system capacities status for BGP:

```
switch# show capacities-status bgp

System Capacities Status: Filter BGP
Capacities Status Name                                              Value  Maximum
----------------------------------------------------------------------------------
--
Number of aspath-lists configured                                   0      64
Number of community-lists configured                                0      64
Number of neighbors configured across all VRFs                      0      50
Number of peer groups configured across all VRFs                    0      25
Number of prefix-lists configured                                   0      64
Number of route-maps configured                                     0      64
Number of routes in BGP RIB                                         0      256000
Number of route reflector clients configured across all VRFs        0      16
```

Showing the system capacities status for L3:

```
switch# show capacities-status l3

System Capacities Status: Filter L3 resources
Capacities Status Name                                                 Value
Maximum
----------------------------------------------------------------------------------
--
Number of IP neighbor (IPv4+IPv6) entries                               4
49152
Number of IP Directed Broadcast neighbor entries                        0
4096
Number of IPv6 Long Prefix Routes currently configured                  3
5000
Number of IPv6 neighbor(ND) entries                                     4
49152
Number of L3 Groups for IP Tunnels and ECMP Groups currently configured 1
2047
Number of L3 Destinations for Routes, Nexthops in ECMP groups and
      Tunnels currently configured                                      4
2045
Number of routes (IPv4+IPv6) currently configured                       5
65536
Number of IPv4 routes currently configured                              0
65536
Number of IPv6 routes currently configured with prefix 0-64             4
13312
Number of IPv6 routes currently configured with prefix 65-127           2
510
```

```
switch# show capacities-status l3

System Capacities Status: Filter L3 resources
Capacities Status Name                                                 Value
Maximum
----------------------------------------------------------------------------------
--
Number of IP neighbor (IPv4+IPv6) entries                               4
49152
Number of IP Directed Broadcast neighbor entries                        0
4096
Number of IPv6 Long Prefix Routes currently configured                  3
5000
Number of IPv6 neighbor(ND) entries                                     4
49152
Number of L3 Groups for IP Tunnels and ECMP Groups currently configured 1
2047
Number of L3 Destinations for Routes, Nexthops in ECMP groups and
      Tunnels currently configured                                      4
2045
Number of routes (IPv4+IPv6) currently configured                       5
65536
Number of IPv4 routes currently configured                              0
65536
```

```
Number of IPv6 routes currently configured with prefix 0-64           4
13312
Number of IPv6 routes currently configured with prefix 65-127         2
510
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.13	Updated to show newly supported configuration of IPv6 routes on the ASIC.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show object-group

```
show object-group [{ip|ipv6} address | port] [<OBJECT-GROUP-NAME>] [commands]
[configuration]
```

Description

Shows information about your defined object groups. When **show object-group** is entered without parameters, information for all object groups is shown. The parameters filter the list of object groups for which information is shown.

Parameter	Description
`[{ip|ipv6} address	port]`	Specifies the object group type, either **address** for an IP address, or **port**.
<OBJECT-GROUP-NAME>	Specifies the object group name.
`[commands]`	Specifies that the object group definition is to be shown as the commands and parameters used to create it rather than in tabular form.
`[configuration]`	Specifies that the user-configured object groups be shown as configured. The output of the command with this parameter may not be the same as what is active on the switch due to a misconfigured object group. See *Examples* in this topic.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not

Parameter	Description
	have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing configured object groups:

```
switch# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
--------------------------------------------------------------------------------
IPv4       my_address_group
        10 192.168.0.1
        20 192.168.0.3
Port       my_port_group
        10 eq 80
        20 gt 65525
switch#
switch# show object-group commands
object-group ip address my_address_group
    10 192.168.0.1
    20 192.168.0.3
object-group port my_port_group
    10 eq 80
    20 gt 65525
```

Showing a misconfigured object group:

```
switch# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
--------------------------------------------------------------------------------
! object-group ip address My_ip_object_group user configuration does not match
! the active hardware configuration. Run 'object-group ip address NAME reset'
! to reset the object group to match the active hardware configuration.
IPv4       my_address_group
switch#
switch#
Type       Name
  Sequence L4 Port(s)/IP Address
--------------------------------------------------------------------------------
! object-group ip address My_ip_object_group user configuration does not match
! the active hardware configuration. Run 'object-group ip address NAME reset'
! to reset the object group to match the active hardware configuration.
IPv4       my_address_group
switch#
switch# show object-group configuration
Type       Name
  Sequence L4 Port(s)/IP Address
--------------------------------------------------------------------------------
! object-group ip address My_ip_object_group user configuration does not match
! the active hardware configuration. Run 'object-group ip address NAME reset'
! to reset the object group to match the active hardware configuration.
IPv4       my_address_group
        10 192.168.0.1
        20 192.168.0.3
switch#
```

```
switch# show object-group commands
! object-group ip address My_ip_object_group user configuration does not match
! the active hardware configuration. Run 'object-group ip address NAME reset'
! to reset the object group to match the active hardware configuration.
switch#
switch# show object-group commands configuration
! object-group ip address My_ip_object_group user configuration does not match
! the active hardware configuration. Run 'object-group ip address NAME reset'
! to reset the object group to match the active hardware configuration.
object-group ip address my_address_group
    10 192.168.0.1
    20 192.168.0.3
```

Resetting a misconfigured object group:

```
switch(config)# object-group all reset
switch(config)# exit
switch# show object-group
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv4       my_address_group
switch#
switch# show object-group configuration
Type       Name
  Sequence L4 Port(s)/IP Address
-------------------------------------------------------------------------------
IPv4       my_address_group
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 6

ACL and Policy hardware resource commands

show resources

```
show resources [<SLOT-ID>] [vsx-peer]
```

Description

On the 6300 switch, shows hardware resource consumption for the specified VSF member or for all VSF members. On the 6400 switch, shows hardware resource consumption for the specified line module or for all line modules. Resource data is updated every 10 seconds.

Hardware resource consumption information is shown for:

- TCAM entries
- TCAM lookups
- Policers

Parameter	Description
<SLOT-ID>	Specifies the VSF member on the 6300 switch and the member and slot of the line module on the 6400 switch. For example, on the 6400 switch, to specify the line module in member 1, slot 2, enter `1/2`.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

The widths for show resources can have features combined (IPv4 + IPv6) into one TCAM lookup. Therefore, the table widths for each ACL/classifier policy type are variable depending on what is applied. For example:

```
  "Ingress IP Port ACL" = Ingress v4 Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2) /  "Ingress IP Port ACL" = Ingress v4
Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2C(v2)/  "Ingress IP Port ACL" = Ingress
v4 Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2C(v2) /  "Ingress IP Port ACL" = Ingress
v4 Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2) /  "Ingress IP Port ACL" = Ingress v4
Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2C(v2)/  "Ingress IP Port ACL" = Ingress
v4 Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2C(v2C(v2)/  "Ingress IP Port ACL" =
Ingress v4 Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2) /  "Ingress IP Port ACL" = Ingress v4
Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2C(v2)/  "Ingress IP Port ACL" = Ingress
v4 Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries/  "Ingress IP Port ACL" = Ingress v4 Port
ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entriC(v2C(v2C(v2)
```

Widths per feature are as follows:

```
MAC ACL    1
IPv4 ACL   1
IPv6 ACL   4
MAC Class  1
IPv4 Class 2
IPv6 Class 4
```

A MAC Class with an ethertype of "any" has a width of 7 because it uses one TCAM entry each for MAC, IPv4, and IPv6. Specifying the IPv4 (0x0800) or IPv6 (0x86DD) ethertypes in a MAC Class uses a TCAM entry equal to their respective size. IPv4 uses a width of 2 and IPv6 uses a width of 4.

```
  "Ingress IP Port ACL" = Ingress v4 Port ACLs + Ingress v6 Port ACLs
                        = 1 TCAM entry + 4 TCAM entries
                        = 5 TCAM entries
```

```
IPv4 ACL   2
MAC ACL    2
IPv6 ACL   4
IPv4 Class 2
IPv6 Class 4
```

Examples

Showing hardware resource consumption on a 6300 switch:

```
switch# show resources

Resource Usage:

Mod  Description
         Resource                                   Used Reserved    Free
-------------------------------------------------------------------------
1/1  Ingress IP Port ACL Lookup
         Ingress TCAM Entries                         20        0    5093
     Total
         Ingress Lookups                               1        0       4
         Egress Lookups                                0        0       4
```

Showing hardware resource consumption for all line modules on a 6405 switch:

```
switch# show resources

Resource Usage:

Mod  Description
         Resource                                   Used     Free
-------------------------------------------------------------------------
1/3  Total
         Ingress Lookups                               0        5
         Egress Lookups                                0        4
1/5  Total
         Ingress Lookups                               0        5
         Egress Lookups                                0        4
```

```
switch# show resources

Resource Usage:

Mod  Description
         Resource                                   Used Reserved    Free
-------------------------------------------------------------------------
1/1  Total
         Ingress TCAM Entries                          0        0    5120
         Egress TCAM Entries                           0        0    2048
         Ingress Lookups                               0                9
         Egress Lookups                                0                4
         Ingress Policers                              0             2047
         Egress Policers                               0             2047
```

```
switch# show resources
Resource Usage:
Mod  Description
         Resource                                   Used Reserved    Free
-------------------------------------------------------------------------
1/1  Ingress IPv4 VLAN ACL Lookup
         Ingress TCAM Entries                          4      128
     Ingress IPv6 VLAN ACL Lookup
         Ingress TCAM Entries                          8      128
     Ingress IP CPURX Lookup
         Ingress TCAM Entries                        126      128
         Ingress Policers                             19
     Ingress IP Port Policy Lookup
         Ingress TCAM Entries                          2      128
     Ingress IP VLAN Policy Lookup
         Ingress TCAM Entries                         12      128
     Total
         Ingress TCAM Entries                        152      640    3448
         Ingress Lookups                               5               27
         Ingress Policers                             19             2029
```

```
switch# show resources 1/1
Resource Usage:
Mod  Description
         Resource                          Width    Used Reserved    Free
-------------------------------------------------------------------------
1/1  Ingress IPv4 Port ACL
         High-Capacity TCAM/LPM Entries        2       0   262144
     MAC Control Plane Policing
         TCAM Entries                          2      16      256
     IPv4 Control Plane Policing
         TCAM Entries                          2      70      256
     IPv6 Control Plane Policing
         TCAM Entries                          2      72        *
     IPv4 Unicast Route
         High-Capacity TCAM/LPM Entries        1       0   131072
     IPv6 Unicast Route
         High-Capacity TCAM/LPM Entries        2       0   262144
     IPv4 Multicast Route
         High-Capacity TCAM/LPM Entries        2       0    65536
     IPv6 Multicast Route
         High-Capacity TCAM/LPM Entries        4       0    65536
     Total
         TCAM Entries                                158      512   49664
         High-Capacity TCAM/LPM Entries                0   786432  258048
         Policers                                      0            65536
         Ingress L4 Port Ranges                        0               24
* This feature shares reserved resources with the preceding feature.
```

```
switch# show resources
Resource Usage:
Mod  Description
         Resource                          Width    Used Reserved    Free
-------------------------------------------------------------------------
1/1  Ingress IPv4 Port ACL
```

```
    Ingress TCAM Entries                  1      2     2048
Ingress MAC+IPv4 Port Policy
    Ingress TCAM Entries                  2      8     2048
Ingress Control Plane Policing
    Ingress TCAM Entries                  2    152     1024
Egress Control Plane Policing
    Egress TCAM Entries                   2     84      256
Total
    Ingress TCAM Entries                       162     5120   11264
    Egress TCAM Entries                         84      256     768
    Policers                                     0            16384
    Ingress L4 Port Ranges                       0               32
```

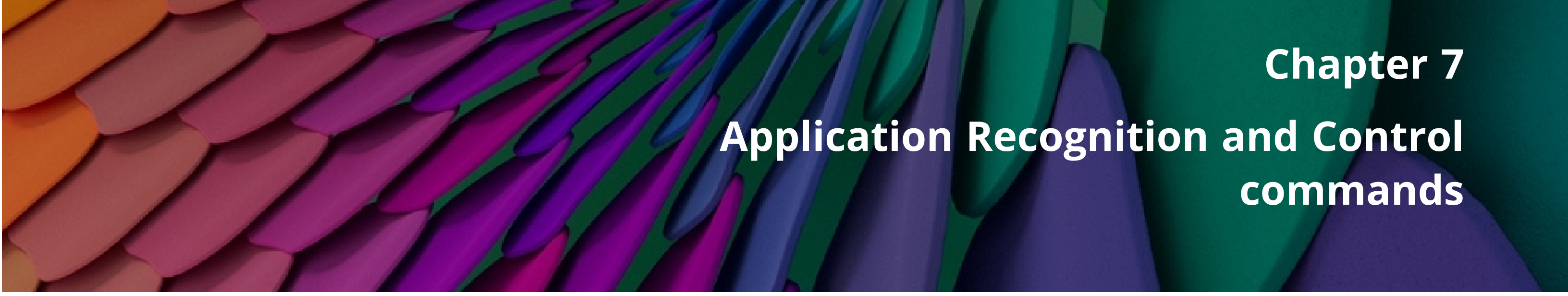
For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 7

Application Recognition and Control commands

app-recognition

```
[no] app-recognition
   [no]enable
```

Description

The ARC feature recognize applications running on the network and control them based on user configurations. You can enable ARC globally, or on one or more interfaces and physical bridged ports.

The no form of this command deletes the ARC configuration context.

IP source lockdown resource extended mode needs to be disabled before you enable ARC feature. For more information, see the *IP Services Guide*.

Parameter	Description
`[no] enable`	Enable or disable ARC for both IPv4 and IPv6 Flows

Examples

The following example creates the ARC configuration context.

```
switch(config)# app-recognition
```

The following example deletes the ARC configuration context.

```
switch(config)# no app-recognition
```

The following example enables application traffic recognition globally.

```
switch(config)# app-recognition
switch(config-app-recognition)# enable
```

The following example disable application traffic recognition globally.

```
switch(config)# app-recognition
switch(config-app-recognition)# no enable
```

The following example enables application traffic recognition on interface **1/1/1**.

```
switch(config)# int 1/1/1
switch(config-if)# app-recognition enable
```

The following example disable application traffic recognition on interface **1/1/1**.

```
switch(config)# int 1/1/1
switch(config-if)# no app-recognition enable
```

The following example enables application traffic recognition for user role **guest**.

```
switch(config)# port-access role guest
switch(config-pa-role)# app-recognition enable
```

The following example disable application traffic recognition for user role **guest**.

```
switch(config)# port-access role guest
switch(config-pa-role)# no app-recognition enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400 (v2
profile only
	`config`
	`config-if`
	`config-app-recognition`
		Administrators or local user group members with execution rights for this command.

show app-recognition

```
show app-recognition
   [<IF-NAME> | <IF-RANGE>]
   app [<APP-NAME>]
   app-category [<APP-CATEGORY>]
```

Description

Displays ARC configuration and status.

Parameter	Description
`app-recognition`	Display ARC information globally.
`<IF-NAME>`	Display ARC information for an interface.
`<IF-RANGE>`	Display ARC information for the specified range of interface.
`app`	Display application information.
`app <APP-NAME>`	Display information for the specified application.
`app-category`	Display application category information.
`app-category <APP-CATEGORY>`	Display information for the specified application category. ■ **antivirus**: Antivirus updates ■ **any**: Any application category ■ **authentication**: Protocol used for authentification purposes ■ **behavioral**: Protocol classified by non-deterministic criteria based on statistical analysis of packet form and session behavior ■ **cloud-file-storage**: Cloud File Storage related applications ■ **collaboration**: Collaboration applications ■ **custom**: Custom family of applications ■ **encrypted**: Encryption protocol applications ■ **enterprise-apps**: Enterprise applications ■ **gaming**: Gaming protocol and applications ■ **im-file-transfer**: IM File Transfer application category ■ **instant-messaging**: Instant Messaging applications ■ **mail-protocols**: Email exchange protocol ■ **mobile**: Mobile applications ■ **mobile-app-store**: Mobile app store and applications ■ **network-service**: Low level network protocol and applications ■ **peer-to-peer**: Peer to Peer applications ■ **social-networking**: Social Networking applications ■ **standard**: Standard applications ■ **streaming**: Streaming applications ■ **thin-client**: Remote control protocol and applications ■ **tunneling**: Tunneling protocol and applications ■ **unified-communications**: Unified Communication protocols and applications ■ **unknown**: Unknown applications ■ **web**: Generic web traffic ■ **webmail**: Web email applications

Usage

ARC can be enabled directly on an interface or can be enabled via a port-access role. When ARC is enabled on a port-access role, all the interfaces associated with that role are enabled with ARC.

The names of the applications used in the document are the intellectual property of their respective companies that make them. The trademark names are used only as examples in the document.

Examples

The following example displays global application port configuration information. The **User-Config** column reflects the direct enablement on a specific port, **Port-Access-Config** column reflects the enablement on a port-access role and the **Oper-Status** column reflects the final state of the ARC on that port.

```
switch# show app-recognition
 Application Recognition Global Configuration
   Configuration status            : Enabled
   Operational Status              : Enabled
   ABP Session Limit Exceed Action : Drop New Flows
   Operational Mode                : Fast
   Failure Reason                  : NA

 Application Recognition Port Configuration

   Interface    User-Config   Port-Access-Config       Oper-Status
   ---------------------------------------------------------------
   1/1/1        Enabled           Disabled             Enabled
   1/2/3        Disabled          Disabled             Disabled
   1/2/4        Disabled          Enabled              Enabled
   1/2/5        Enabled           Enabled              Enabled
```

The following example displays the ARC configuration on interface **1/1/1**.

```
switch#show app-recognition 1/1/1

Application Recognition Port Configuration

 Interface    User-Config   Port-Access-Config         Oper-Status
 -----------------------------------------------------------------
 1/2/1        Enabled         Disabled                  Enabled
```

The following example displays the ARC configuration for the specified interface range **1/2/3-1/2/5**.

```
switch# show app-recognition 1/2/3-1/2/5

Application Recognition Port Configuration

 Interface    User-Config   Port-Access-Config         Oper-Status
 -----------------------------------------------------------------
 1/2/3        Enabled         Disabled                  Enabled
 1/2/4        Disabled        Enabled                   Enabled
 1/2/5        Enabled         Enabled                   Enabled
```

The following example displays a list of applications recognized by the traffic application feature.

```
switch# show app-recognition app

 NAME           ID    CATEGORY               DESCRIPTION
 -------------- ----- ---------------------- -------------------------------
 call-of-duty   3490  gaming                 Call of duty (aka COD) is a video
game ...
 facebook        244  social-networking      Facebook is a social network.
 twitter         503  social-networking      Online microblogging service that
enables...
```

```

 NAME           ID    CATEGORY                DESCRIPTION
 -------------- ----- ---------------------- --------------------------------
 call-of-duty   3490  gaming                  Call of duty (aka COD) is a video
game ...
 facebook        244  social-networking       Facebook is a social network.
 twitter         503  social-networking       Online microblogging service that
enables...
```

The following example displays information for **Facebook**.

```
switch# show app-recognition app facebook
 NAME        : facebook
 ID          : 244
 CATEGORY    : social-networking
 DESCRIPTION : Facebook
```

The following example displays a list of application category recognized by the traffic application feature.

```
switch# show app-recognition app-category

 CATEGORY                DESCRIPTION
 ----------------------- ------------------------------------
 gaming                  Gaming application category
 social-networking       Social Networking application category
```

The following example displays information for **gaming** category.

```
switch# show app-recognition app-category gaming
 NAME        : gaming
 DESCRIPTION : Gaming application category
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	Manager (#)	Administrators or local user group members with execution rights for this command.

class

```
[no] class {abp-ip | abp-ipv6} <CLASS-NAME>
   [no] [<SEQUENCE-NUMBER>] {match|ignore} {tcp|udp|any} {SRC-IP-ADDRESS}
   [{gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|eq {<PORT-NAME>|<PORT>}]
   {any|<DST-IP-ADDRESS|DST-L4-PORT>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
   [{gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|eq {<PORT-NAME>|<PORT>}]
   {app-category {any | <APP-CATEGORY>} {app {any | <APP-NAME>}} [count]

   [no] [<SEQUENCE-NUMBER>] {match|ignore} {any} {SRC-IP-ADDRESS}
   [{gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>|eq {<PORT-NAME>|<PORT>}]
   {any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
   {app-category {any | <APP-CATEGORY>} {app {any | <APP-NAME>}} [count]

   [no] <SEQUENCE-NUMBER>

class {abp-ip | abp-ipv6} <CLASS-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>
class {abp-ip | abp-ipv6} <CLASS-NAME> copy <DESTINATION-CLASS>
```

Description

Create and configure a class to match application-based packets.

The **no** keyword can be used to delete either a class or an individual class entry.

Parameter	Description
`abp-ip`	Create or configure an IPv4 application-based policy.
`abp-ipv6`	Create or configure an IPv6 application-based policy.
`app <APP-NAME>`	Configure a class for the specified application. **NOTE:** The **app <unknown>** under **app-category *<standard>*** matches all recognized flows whose application id is unknown or unmapped.
`app-category {<APP-CATEGORY>}`	Configure a class for the specified application category. **NOTE:** A class configured to match against the **unknown** app-category matches all recognized flows whose application id is unknown. A class configured to match against the **any** app-category matches all recognized flows regardless of their application id. Application-based policies can be applied to anyof the following application types: ■ **antivirus**— Antivirus updates ■ **any**— Matches all recognized flows irrespective of their application id ■ **authentication**— Protocol used for authentification purposes ■ **behavioral**— Protocol classified by non-deterministic criteria based on statistical analysis of packet form and session behavior ■ **cloud-file-storage**— Cloud File Storage related applications ■ **collaboration**— Collaboration applications ■ **custom**— Custom family of applications ■ **encrypted**— Encryption protocol applications ■ **enterprise-apps**—Enterprise applications

Parameter	Description
	■ **gaming**—Gaming protocol and applications ■ **im-file-transfer**— IM File Transfer application category ■ **instant-messaging**— Instant Messaging applications ■ **mail-protocols**— Email exchange protocol ■ **mobile**—Mobile applications ■ **mobile-app-store**—Mobile app store and applications ■ **network-service**—Low level network protocol and applications ■ **peer-to-peer**—Peer-to-Peer applications ■ **social-networking**—Social Networking applications ■ **standard**— Standard applications ■ **streaming**— Streaming applications ■ **thin-client**—Remote control protocol and applications ■ **tunneling**— Tunneling protocol and applications ■ **unified-communications**—Unified Communication protocols and applications ■ **unknown**—Unknown applications ■ **web**—Generic web traffic ■ **webmail**— Web email applications
`CLASS-NAME`	Define a class name for which the application-based policy is being created or configured.
`comment <`*`STRING`*`>>`	Add a comment to the traffic class.
`copy <DESTINATION-CLASS>`	Copy the settings of this traffic class to another specified traffic class. **NOTE:** Copying a class to a pre-existing class will overwrite the pre-existing entries with new entries.
`count`	Calculates the number of times the ABP was applied to the traffic.
`dst-ip-address`	Specify a destination IP address to classify traffic to this destination IP.
`/{<PREFIX-LENGTH>|<SUBNET-MASK>}`	Optional. Specify an address mask for the destination IP in one of the following formats: ■ **/<PREFIX-LENGTH>**: Subnet mask in CIDR notation.It is an integer between 1 to 32. ■ **<SUBNET-MASK>**: Subnet mask in dotted-decimal notation (for example, **255.255.255.0**).
`dst-l4-port`	Specify a destination L4 port or port range to classify traffic to this destination port. Only on selecting **tcp|udp** you get the option to configure the destination L4 port or port range.
`gt <port>`	Classify traffic to a layer 4 destination port with a port numbers greater than the specified layer 4 port number.

Parameter	Description
`lt <port>`	Classify traffic to a layer 4 destination port with a port numbers lesser than the specified layer 4 port number.
`eq <port>`	Classify traffic to layer 4 source port. ■ **PORT-NAME**—A single Layer 4 port name `{ftp-data|ftp|ssh|telnet|smtp|tacacs|dns|dhcp-server|dhcp-client|tftp|http|https|pop3|nntp|ntp|dce-rpc|netbios-ns|netbios-dgm|netbios-ssn|snmp|snmp-trap|bgp|ldap|microsoft-ds|isakmp|syslog|imap4|radius|radius-acct|iscsi|rdp|nat-t|vxlan}` ■ **PORT**—A single Layer 4 port
`range <min-port>-<max-port>`	Layer 4 port range. ■ **min-port**—The start of a Layer 4 port range. ■ **max-port**—The end of a Layer 4 port range.
`ignore`	Creates a rule that ignores traffic to the specified destination, application, or application category.
`match`	Creates a rule that matches traffic to the specified destination, application, or application category.
`no ...`	Negates any configured parameter.
`resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`	By default, rules added to a traffic class are applied in the order in which they are created. You can also use the **sequence** parameter to define the sequence numbers for each rule in the traffic class. To change the order in which a rule is applied, you must change its sequence number. Use the **resequence** command and specify the current (starting) sequence number of the rule, and the number by which you want to increment the rule. For example, use the parameters **resequence 40 10** to change the rule with the sequence value of 40 to have a sequence value of 30 (an increase of 10).
`[all]reset`	Use this parameter to change the user-specified application-based policy configuration to match the active application-based policy configuration. ■ **class all reset**: reset all classes. ■ **class <name> reset**: reset only the specified class. ■ **class abp-ip reset**: reset all IPv4 application-based policy classes. ■ **class abp-ipv6 reset**: reset all IPv6 application-based policy classes.
`SEQUENCE-NUMBER`	Specify the class entry sequence number. Integer (1-4294967295)
`SRC-IP-ADDRESS`	Source IP Address parameter value must be set to **any** source.

Parameter	Description
`src-l4-port`	Specify a source L4 port or port range to classify traffic from this source port.
`eq <port>`	Classify traffic from the specified source port.
`gt <port>`	Classify traffic from source ports with port numbers greater than the specified port number.
`lt <port>`	Classify traffic from source ports with port numbers lesser than the specified port number.
`tcp`	Apply the application classification policy to TCP traffic
`udp`	Apply the application classification policy to UDF traffic

Usage

Application based classification works only for the ports that has application recognition enabled. For more information on enabling application recognition on a port, see app-recognition.

When a client initiates a new traffic flow, the AOS-CX app recognition module views the first few initial packets to learn the flow and identify the application. Application-based policy rules are applied only after this flow recognition phase. Application based policies have a default **deny** behavior that is applied to traffic flows that do not match any configured ABP rules. This implicit deny rule is added to the policy only after the flow recognition phase is completed.

It is possible to create redundant class entries for a class that have the same match criteria and actions. Avoid redundant class entries, as each redundant copy of the class will consume additional processing resources.

Examples

The following example creates a application IPv4 class **my_app_ipv4_cls** with four rule entries.

```
switch(config)# class abp-ip my_app_ipv4_cls
switch(config-class-abp-ip)# 10 match udp any any app-category web app youtube-
music count
switch(config-class-abp-ip)# 20 match tcp any eq 60 any app-category enterprise-
apps app workday
switch(config-class-abp-ip)# 30 match any any any app-category any app any count
switch(config-class-abp-ip)# 40 ignore any any 10.0.0.10/24 app-category standard
app unknown
```

The following example creates a application IPv6 class **my_app_ipv6_cls** with two rule entries.

```
switch(config)# class abp-ipv6 my_app_ipv6_cls
switch(config-class-abp-ipv6)# 10 match any any 2001:db8::1319:8a2e:370:7348 app-
category standard app unknown
switch(config-class-abp-ipv6)# 20 match udp any eq telnet any app-category social-
networking app instagram count
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400 (v2
profile only
	`config`
	`config-class-abp-ip`
	`config-class-abp-ipv6`
		Administrators or local user group members with execution rights for this command.

show class

```
show class {abp-ip | abp-ipv6} <CLASS-NAME> [commands] [configuration]
```

Description

Display information of the active classes that are configured and accepted by the system.

Parameter	Description
`abp-ip`	Display information for all IPv4 application classes that have been configured and accepted by the system.
`abp-ipv6`	Display information for all IPv6 application classes that have been configured and accepted by the system.
`commands`	Display the commands used to configure the current application-based policies.
`configuration`	Display a list of commands use to configure the active application-based policy classes.
`comment <string>`	Add a comment to the traffic class,
`copy <DESTINATION-CLASS>`	Copy the settings of this traffic class to another specified traffic class. **NOTE:** Copying a class to a pre-existing class will overwrite the pre-existing entries with new entries.
`dst-ip-address <DST-IP-ADDRESS>`	Specify a destination IP address to classify traffic to this destination IP.
`/<PREFIX-LENGTH>|<SUBNET-MASK>}`	Optional. Specify an address mask for the destination IP in one of the following formats: ■ /<PREFIX-LENGTH>: Subnet mask in

Parameter	Description
	CIDR notation. It is an integer between 1 to 32. ■ <SUBNET-MASK>: Subnet mask in dotted-decimal notation (for example, **255.255.255.0**).
`dst-l4-port`	Specify a destination L4 port or port range to classify traffic to this destination port.
`eq <port>`	Classify traffic to the specified destination port.
`gt <port>`	Classify traffic to destination ports with port numbers greater than the specified port number.
`lt <port>`	Classify traffic to destination ports with port numbers lesser than the specified port number.
`range <min-port>-<max-port>`	Classify traffic to destination ports within the specified range.
`ignore`	Creates a rule that ignores traffic to the specified destination, application, or application category.
`match`	Creates a rule that matches traffic to the specified destination, application, or application category.
no ..,	Negates any configured parameter.
`resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`	By default, rules added to a traffic class are applied in the order in which they are created. You can also use the **sequence** parameter to define the sequence numbers for each rule in the traffic class. To change the order in which a rule is applied, you must change its sequence number. Use the **resequence** command and specify the current (starting) sequence number of the rule, and the number by which you want to increment the rule. For example, use the parameters **resequence 40 10** to change the rule with the sequence value of 40 to have a sequence value of 30 (an increase of 10).
`src-l4-port`	Specify a source L4 port or port range to classify traffic from this source port.
`eq <port>`	Classify traffic from the specified source port.
`gt <port>`	Classify traffic from source ports with port

Parameter	Description
	numbers greater than the specified port number.
`lt <port>`	Classify traffic from source ports with port numbers lesser than the specified port number.
`range <min-port>-<max-port>`	Classify traffic from source ports within the specified range.
`tcp`	Apply the application classification policy to TCP traffic
`udp`	Apply the application classification policy to UDF traffic

Usage

The **show class configuration** displays all configured classes. The output of this command may differ from the active application poicy configuration if a class is configured with an unsupported parameter, or if a the class was not applied due to a lack of hardware resources. To determine if there is a discrepancy between what was configured and what is active, compare the output of the **show class** and **show class configuratio**n commands. If an active class and configured class are not the same, the output of the **show class configuration** command can display a warning message to help troubleshooting the problem. For example:

```
 class abp-ip my_app_class user configuration does not match active configuration.
 run 'class TYPE NAME reset' to reset class to match active configuration.
```

If a new configured class is in the learning phase and currently getting processed, the output of the **show class configuration** command displays the following message:

```
class abp-ip my_app_class user configuration currently being processed run 'show
class [commands]' to display active class configuration.
```

It is possible to create redundant class entries in a class that have the same match criteria and action. Such a configuration is not recommended, as each redundant copy of the class entry will consume additional processing resources.

Examples

The following example displays all IPv4 traffic application classes configured on the switch.

```
switch# show class abp-ip

User Configured abp-ipv4 classes:
=================================

Type       Name
  Sequence Comment
           Action                          Application
           Destination IP Address          L3 Protocol
           Source L4 Port(s)               Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
abp-ipv4    class1
        10
            match                          social-networking - facebook
        20
            ignore                         unknown
            10.0.0.10/24
        30
            match                          social-networking - instagram
                                           tcp
                                           443
--------------------------------------------------------------------------------
abp-ipv4   class2
        10
           match                           music
                                           udp
        20
           match                           news
                                           tcp
                                           443
```

The command output in the folloiwng example displays the commands used to configure the application classes shown in the output shown above.

```
switch# show class commands
class abp-ip class1
10 match any app-category social-networking app facebook
class abp-ip class2
10 ignore any app-category web
20 match any app-category any
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Related Commands

Command	Description
class	Create and configure an application classification policy.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	Manager (#)	Administrators or local user group members with execution rights for this command.

abp-session-limit-exceed-action

```
[no] abp-session-limit-exceed-action {drop-new-flows | log-only}
```

Description

The CLI command configures the Application Based Policy (ABP) Session Limit Exceed Action. Using this configuration, the new flow entries are either dropped or logged without ABP inspection when the session table is full.

The **no** form of this command updates the ABP Session Limit Exceed Action to **drop-new-flows**.

Parameter	Description
`drop-new-flows`	This is the default action for the command **abp-session-limit-exceed-action**. If the session table is full all new flows associated with clients that have ABP configured are dropped.
`Log-only`	If the session table is full, it will log warnings. ABP inspection is not performed and the new traffic flows are not dropped.

Examples

When the session table is full, all new flows that have ABP configured are dropped.

```
switch(config)# app-recognition
switch(config-app-recognition)# abp-session-limit-exceed-action drop-new-flows
```

When the session table is full, only warnings are logged without ABP inspecting and the new client traffic flow passes through.

```
switch(config)# app-recognition
switch(config-app-recognition)# abp-session-limit-exceed-action log-only
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	`config` `config-app-recognition`	Administrators or local user group members with execution rights for this command.

mode

```
mode
   fast
   default
   no ...
```

Description

This command configures Application Recognition operational modes. The operational mode of the Application Recognition feature determines the number of packets processed for each flow and the extent to which attributes can be extracted. With the **default** setting enabled, more packets are processed for each flow, and Application Recognition can extract more attributes for those flows. With the **fast** setting enabled, Application Recognition reduces the number of packets processed for each flow, but will increase the number of connections per second.

Parameter	Description
`fast`	Relies on first packet classification to extract information only about the application name and application category.
`default`	This default setting allows the Application Recognition feature to process additional packets to determine the URL and TLS attributes.
`no ...`	The **no** form of this command sets the mode back to its default value.

Examples

The following example sets the Application Recognition mode to **fast**.

```
switch(config)# app-recognition
switch(config-app-recognition)# mode fast
```

The following example removes the **fast** option and returns the mode to the default value.

```
switch(config)# app-recognition
switch(config-app-recognition)#no mode fast
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.14	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-app-recognition`	Administrators or local user group members with execution rights for this command.

port-access abp

```
[no] port-access abp <POLICY-NAME>
   [no] [<SEQUENCE-NUMBER>] class {abp-ip | abp-ipv6} <CLASS-NAME> [action {drop | dscp
   <value> | local-priority <value> | mirror <value>}]
   [no] [<SEQUENCE-NUMBER>] comment <TEXT-STRING>

port-access abp <POLICY-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>
port-access abp <POLICY-NAME> copy <DESTINATION-POLICY>
port-access abp <POLICY-NAME> reset

[no] port-access role <ROLE-NAME>
   [no] associate abp <POLICY-NAME>
```

Description

Create, configure and delete the application-based policy and its entries.

The **no** keyword can be used to delete either a class or an individual class entry.

Parameter	Description
`action {drop | dscp | local-priority | mirror}`	Specify the action Application Recognition will perform for the specified class. **drop:** Drops the traffic. The default action for a policy entry is **permit**, if the action is not specified. **dscp:** Specify the Differentiated Services Code Point value between 0 to 63 or a keyword as follows: **AF11** - DSCP 10 (Assured Forwarding Class 1, low drop probability) **AF12** - DSCP 12 (Assured Forwarding Class 1, medium drop probability) **AF13** - DSCP 14 (Assured Forwarding Class 1, high drop probability) **AF21** - DSCP 18 (Assured Forwarding Class 2, low drop probability) **AF22** - DSCP 20 (Assured Forwarding Class 2, medium drop probability)

Parameter	Description
	AF23 - DSCP 22 (Assured Forwarding Class 2, high drop probability) **AF31** - DSCP 26 (Assured Forwarding Class 3, low drop probability) **AF32** - DSCP 28 (Assured Forwarding Class 3, medium drop probability) **AF33** - DSCP 30 (Assured Forwarding Class 3, high drop probability) **AF41** - DSCP 34 (Assured Forwarding Class 4, low drop probability) **AF42** - DSCP 36 (Assured Forwarding Class 4, medium drop probability) **AF43** - DSCP 38 (Assured Forwarding Class 4, high drop probability) **CS0** - DSCP 0 (Class Selector 0: Default) **CS1** - DSCP 8 (Class Selector 1: Scavenger) **CS2** - DSCP 16 (Class Selector 2: OAM) **CS3** - DSCP 24 (Class Selector 3: Signaling) **CS4** - DSCP 32 (Class Selector 4: Real time) **CS5** - DSCP 40 (Class Selector 5: Broadcast video) **CS6** - DSCP 48 (Class Selector 6: Network control) **CS7** - DSCP 56 (Class Selector 7) **EF** - DSCP 46 (Expedited Forwarding) **local-priority:** Specify a valid local-priority value between 0 to 7. **mirror:** Specify the mirroring session. Only one mirroring session can be mapped to an application policy and only session 4 is supported.
`abp-ip`	Create or configure an IPv4 application-based policy.
`abp-ipv6`	Create or configure an IPv6 application-based policy.
`associate abp`	Applies the policy to a role
`CLASS-NAME`	Define a class name for which the application-based policy is being created or configured.

Parameter	Description
`comment <STRING>>`	Add or modify a comment to the application based policy entries.
`no`	Negates any configured parameter.
`POLICY NAME`	Name of the application based policy to associate with the role (maximum 128 characters).
`resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`	By default, rules added to a traffic class are applied in the order in which they are created. You can also use the **sequence** parameter to define the sequence numbers for each rule in the traffic class. To change the order in which a rule is applied, you must change its sequence number. Use the **resequence** command and specify the current (starting) sequence number of the rule, and the number by which you want to increment the rule. For example, use the parameters **resequence 40 10** to change the rule with the sequence value of 40 to have a sequence value of 30 (an increase of 10).
`reset`	Resets the specified application based policy.
`ROLE NAME`	Name of the role to which the application based policy is associated.
`SEQUENCE-NUMBER`	Specify the class entry sequence number. Integer (1-4294967295)

Usage

Application policies comprise one or more policy entries. These policies are ordered and prioritized based on their sequence numbers. Each policy entry has the following:

- **abp-ip** (IPv4 traffic) or **abp-ipv6** (IPv6 traffic) class
- drop or permit policy actions

The application policy will examine a packet sequentially against all the policy entries and class entries until a match is made. If there are no matches, the packet will be dropped.

The application policies are applied to a role using the **associate abp** command.

If an application policy is associated with a role, it cannot be removed from the configuration. To remove the policy, it must be unassociated from roles that are currently using it.

Entering an existing *POLICY NAME* value will cause the existing policy to be modified. If no **SEQUENCE-NUMBER** is entered then an additional policy entry is created with a new **SEQUENCE-NUMBER**. If an existing **SEQUENCE-NUMBER** is entered then the values of the existing **SEQUENCE-NUMBER** is replaced with the new value.

If no **SEQUENCE-NUMBER** is specified, a new policy entry is added at the end of the entry list with a sequence number that is equal to the highest **SEQUENCE-NUMBER** of a policy entry currently in the list plus 10. The sequence numbers may be reordered with the **class resequence** command.

The **port-access role** command is used to associate a application policy with the source user role.

Examples

Creating a new application class on an application policy with the *POLICY-NAME* name **guest_policy**.

```
switch(config)# port-access abp guest_policy
switch(config-pa-app)# class abp-ip class1
                   10 match any any any app-category streaming app youtube count
switch(config-pa-app)# class abp-ipv6 class2
                    10 match any any any app-category web app http count
```

Associate the application policy on a port access source role with the *ROLE NAME* **role01**.

```
switch(config)# port-access role role01
switch(config-pa-role)# associate abp guest_policy
switch(config-pa-app)# exit
switch(config)# show port-access role name role01

Role Information:
Attributes overridden by RADIUS are prefixed by '*'.

Name  : role01
Type  : local
----------------------------------------------
Access VLAN                         : 3000
Access VLAN Name                    : hpe
App Recognition                     : enabled
*App Based Policy                    : guest_policy
```

Associate an existing policy **guest_policy** to the **EMPLOYEE** role.

```
switch(config)# port-access role EMPLOYEE
switch(config-pa-role)# associate abp guest_policy
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	The sub-paramaters, **dscp, local-priority, and mirror** were introduced.
10.12	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400 (v2 profile only
	`config`
	`config-class-abp-ip`
	`config-class-abp-ipv6`
		Administrators or local user group members with execution rights for this command.

show port-access abp

```
show [run] port-access abp
show port-access abp [<POLICY-NAME>]
```

Description

Displays the application policies and its current usages. If the command is used without specifying the *POLICY-NAME* then it displays the details of all the configured application policies on the switch.

Parameter	Description
Application Policy	Types of Application Policy: - Local—User configured policy - DUR—Downloadable User Role policies
Application policy status	The current running status of the Application policy: - Applied—Policy is successfully applied in the hardware - Rejected—Policy is not supported in the hardware. - In-Progress—Policy is being processed in the hardware.
POLICY-NAME	Name of the application based policy to associate with the role (maximum 128 characters).

Examples

The following example display all application policies configured on the switch:

```
switch# show port-access abp
Port Access Application Policy User Configured Policy Details:
==============================================================
App Policy Name   : app1
App Policy Type   : Local
App Policy Status : Applied


SEQUENCE    CLASS                            TYPE     ACTION
----------- -------------------------------- -------- -----------------------
10          class1                           abp-ipv4  permit
App Policy Name   : app-policy
App Policy Type   : local
App Policy Status : applied


SEQUENCE    CLASS                         TYPE       ACTION
----------- ----------------------------- ---------- -----------------------------
------
10          app-class                     abp-ipv4   drop
20          app-class                     abp-ipv4   dscp AF31
30          app-class                     abp-ipv4   local-priority 5
```

```
40          app-class                     abp-ipv4   mirror 4
50          app-class                     abp-ipv4   local-priority 3 dscp AF11
mirror 4
```

When no application policies are configured

```
switch# show port-access abp
Application policy is not configured.
```

When the specified application policy does not exist

```
switch# show port-access abp plcy
Application Based Policy does not exist.
```

Display the policy currently running on the port.

```
switch# show run port-access abp
port-access abp app1
    10 class abp-ip class1
```

Usage

The **show port-access abp** command displays all the active configuration. It providing the list of classes that are configured and accepted by the system.

The **show running-config port-access abp** command may not be the same as in active configuration. This is due to the following:

- unsupported command parameters
- class modified after the app policy was applied
- ABP configuration was unsuccessful due to a lack of hardware resources

Compare the output of the **show port-access abp** and **show running-config port-access abp** commands to see if there is a mismatch between what was configured and what is active. If the active abp and the configured abp are not the same, a warning message is displayed to help troubleshoot the problem.

If the port-access abp is being processed, an in-progress message will be displayed.

```
switch(config)# show run
...
! port-access abp <POLICY-NAME> user configuration currently being processed
! run 'show port-access abp' to display active application policy
! configuration.
port-access abp policy_1
...
switch(config)# show running-config port-access abp
! port-access abp <POLICY-NAME> user configuration currently being processed
! run 'show port-access abp' to display active application policy
! configuration.
port-access abp policy_1
10 class abp-ip app_ip_class action drop
```

If the warning or in-progress message is displayed, additional changes may be made until the error message is no longer displayed when **show port-access abp**, **show port-access abp commands**, **show port-access abp commands configuration**, or **run the port-access abp reset** commands are entered.

The **port-access abp reset** command changes the user-specified configuration to match the active configuration.

Display details of a particular application policy that needs reset:

```
switch(config-pa-abp)# show run port-access abp
! port-access abp plcy user configuration does not match active configuration.
! run 'port-access abp <POLICY-NAME> reset' to reset application policy to match
! the active configuration.
port-access abp plcy
    10 class abp-ip cs action drop
    20 class abp-ipv6 cls6

switch(config-pa-abp)# show port-access abp plcy
Port Access Application Policy User Configured Policy Details:
==============================================================

App Policy Name   : plcy
App Policy Type   : Local
App Policy Status : Rejected

SEQUENCE    CLASS                            TYPE     ACTION
----------- -------------------------------- -------- -----------------------
10          cs                               abp-ipv4 drop
20          cls6                             abp-ipv6 permit

switch# port-access abp plcy reset
Following abp entries will be removed:
30 class abp-ip cls2

Do you want to continue (y/n)? y

switch# sh running-config port-access abp
port-access abp plcy
    10 class abp-ip cls action drop
    20 class abp-ipv6 cls6
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	Command output modified to display the following actions: **dscp** **local-priority** **mirror**
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	Manager (#)	Administrators or local user group members with execution rights for this command.

show port-access abp hitcounts

```
show port-access abp [<POLICY-NAME>] hitcounts
```

Description

This command is used to show the statistics of the application policy applied on the client. The output helps to identify the application policy entries that are currently matched.

Parameter	Description
hitcounts	The hit counts (statistics) of the application policy
POLICY-NAME	Name of this application policy

Usage

If a class entry is configured with the count action, then the show command will display the statistics of that entry. The class entries without the count action are not displayed in the hitcounts output. For collecting the statistics for a specific client, create a copy of the desired policy and attach it to the respective client.

Examples

The following example display show hitcounts of a Application Policy

```
 switch # show port-access abp app-policy hitcounts
Port Access ABP Hit-Counts Details:
======================================
App Policy Name   : app-policy
App Policy Type   : local
App Policy Status : applied


SEQUENCE    CLASS                         TYPE       ACTION
----------- ----------------------------- ---------- -----------------------------
------
10          app-class1                    abp-ipv4   drop
20          app-class2                    abp-ipv4   dscp AF31
30          app-class3                    abp-ipv4   local-priority 5
40          app-class4                    abp-ipv4   mirror 4
50          app-class5                    abp-ipv4   local-priority 3 dscp AF11
mirror 4


Class Name : app-class1
Class Type : abp-ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match any any any app-category network-service app any
```

```
count                                                       1234


Class Name : app-class2
Class Type : abp-ipv4

SEQUENCE    CLASS-ENTRY                                                HIT-COUNT
----------- ---------------------------------------------------------- -----------
10          match any any any app-category encrypted app any count    4312


Class Name : app-class3
Class Type : abp-ipv4

SEQUENCE    CLASS-ENTRY                                                HIT-COUNT
----------- ---------------------------------------------------------- -----------
10          match any any any app-category social-networking app any
count                                                       0


Class Name : app-class4
Class Type : abp-ipv4

SEQUENCE    CLASS-ENTRY                                                HIT-COUNT
----------- ---------------------------------------------------------- -----------
10          match any any any app-category streaming app any count    777


Class Name : app-class5
Class Type : abp-ipv4

SEQUENCE    CLASS-ENTRY                                                HIT-COUNT
----------- ---------------------------------------------------------- -----------
10          match any any any app-category gaming app any count       71193
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	Command output modified to display the following actions: **dscp** **local-priority** **mirror**
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	Manager (#)	Administrators or local user group members with execution rights for this command.

clear port-access abp hitcounts

`clear port-access abp [<POLICY-NAME>] hitcounts`

Description

This command is used to clear statistics of the application policy applied on the client.

Parameter	Description
hitcounts	The hit counts (statistics) of the application policy
POLICY-NAME	Name of this application policy

Examples

The following example clears the hitcounts of a Application Policy.

```
switch# show port-access abp app1 hitcounts

Port Access Application Policy Hit-Counts Details:
======================================

App Policy Name   : app1
App Policy Type   : Local
App Policy Status : Applied

SEQUENCE    CLASS                            TYPE     ACTION
----------- -------------------------------- -------- -----------------------
10          class1                           abp-ipv4 drop

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
20          match any app-category gaming app any count                      30

switch# clear port-access abp app1 hitcounts

switch# show port-access abp app1 hitcounts

Port Access Application Policy Hit-Counts Details:
======================================

App Policy Name   : app1
App Policy Type   : Local
App Policy Status : Applied

SEQUENCE    CLASS                            TYPE     ACTION
----------- -------------------------------- -------- -----------------------
10          class1                           abp-ipv4 drop

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
20          match any app-category gaming app any count                       0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config app-recognition

```
show running-config app-recognition
```

Description

Shows the active configurations of ARC.

Example

Showing the configured commands for ARC.

```
switch# show running-config app-recognition
 no ip source-lockdown resource-extended
 app-recognition
     enable
     mode fast
 interface 1/1/1
     app-recognition enable
 interface 1/1/2
     app-recognition enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

diag-dump arcd basic

```
diag-dump arcd basic
```

Description

Displays diagnostic information for ARC.

Examples

```
6300# diag-dump arc basic
=========================================================================
[Start] Feature arc Time : Wed Oct 26 15:38:45 2022
=========================================================================
-------------------------------------------------------------------------
[Start] Daemon arcd
-------------------------------------------------------------------------

===  ARCD Global data  ===
===========================================
ARC Global Configuration  : ENABLED
MQTT Publisher Status     : CONNECTED


===  ARCD Global LC Data  ===
===========================================
LC Name    Node Id    State    Flow Count
-------------------------------------------
1/1        0          UP       0
2/1        1          UP       0
3/1        2          UP       0
-------------------------------------------


===  ARCD Global FLOW Data  ===

===========================================
SRC IP      DST IP    SRC Port   Dst Port   Proto   VRF   Agent   State      App
Id
----------------------------------------------------------------------------------
-----

Total Number of Flows : 0
----------------------------------------------------------------------------------
------------


-------------------------------------------------------------------------
[End] Daemon arcd
-------------------------------------------------------------------------
-------------------------------------------------------------------------
[Start] Daemon switchd_agent0
-------------------------------------------------------------------------
======================
FLOW info counters
------------------------------------------------------------
New cache               : 0
Remote cache            : 0
Local cache             : 0
In Hardware             : 0
HW add Req              : 18538535
HW retry Req            : 7538
HW add Req suceess      : 17293746
HW add Req fail         : 45591
HW del Req              : 17293746
HW Bulk del Req         : 2
HW del Req failed       : 0
HW del Req sucess       : 17293746
HW app modify Req       : 1187548
HW app modify Req succs : 1199198
HW app modify Req fail  : 0
Fin req in new          : 6727845
Fin req in local        : 512591
Fin req in remote       : 483600
Fin req in hardware     : 12529218
In notified             : 11022453
Out notified            : 9760743
Purge notified          : 29831736
App notified            : 343865
Flow in msg rcvd        : 3585046
Flow out msg rcvd       : 3726056
Purge msg rcvd          : 19372532
App msg rcvd            : 37820
App update from engine  : 25988004
Pkt rx processed        : 267786598
Flow cache miss events  : 15802856
pthread mutex lock      : 148342552
pthread mutex lock fail : 0
pthread mutex unlock    : 148342552
pthreadmutex unlock fail: 0
==== ARC agent flow cache dump ===
src_ip   dst_ip   src_port   dst_port   prot vrf    ingress_agent_id  state  app_
id
flow_miss_count   ingress_port ingress_vlan
----------------------------------------------------------------------------------
---------------
Entries in New cache : 0
Entries in Hardware cache : 0


-------------------------------------------------------------------------
[End] Daemon switchd_agent0
-------------------------------------------------------------------------
=========================================================================
[End] Feature arc
=========================================================================
Diagnostic-dump captured for feature arc
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	Manager (#)	Administrators or local user group members with execution rights for this command.

show events arcd

```
show events -d arcd
```

Description

Displays event logs generated by the switch modules since the last reboot for ARC.

Examples

Showing event logs of ARC:

```
switch# show events -d arcd
---------------------------------------------------
Event logs from current boot
---------------------------------------------------
2023-04-05T12:12:23.802838+00:00 6410 arcd[2700]: Event|14105|LOG_INFO|UMM|-|ARCD
Publisher is ENABLED
2023-04-05T12:12:23.819248+00:00 6410 arcd[2700]: Event|14101|LOG_INFO|UMM|-|App
Recognition feature has been ENABLED
2023-04-05T12:12:26.047307+00:00 6410 arcd[3009]: Event|14105|LOG_INFO|UMM|-|ARCD
Publisher is ENABLED
2023-04-05T12:12:26.047440+00:00 6410 arcd[3009]: Event|14101|LOG_INFO|UMM|-|App
Recognition feature has been ENABLED
2023-04-05T12:16:32.399665+00:00 EdgeInt arcd[3009]: Event|14103|LOG_INFO|UMM|-
|BULK SYNC event received from linecard 6
2023-04-05T12:16:32.399777+00:00 EdgeInt arcd[3009]: Event|14103|LOG_INFO|UMM|-
|BULK SYNC event received from linecard 7
2023-04-05T15:58:15.601648+00:00 EdgeInt arcd[3009]: Event|14107|LOG_INFO|UMM|-|IP
Flow table utilization has exceeded high threshold on linecard 0
2023-04-06T02:03:42.570806+00:00 EdgeInt arcd[2700]: Event|14103|LOG_INFO|UMM|-
|BULK SYNC event received from linecard 3
2023-04-06T02:03:51.259332+00:00 EdgeInt arcd[2700]: Event|14107|LOG_INFO|UMM|-|IP
Flow table utilization has exceeded high threshold on linecard 3
2023-04-06T02:04:48.713251+00:00 EdgeInt arcd[2700]: Event|14107|LOG_INFO|UMM|-|IP
Flow table utilization has exceeded high threshold on linecard 0
2023-04-06T02:05:54.200794+00:00 EdgeInt arcd[3009]: Event|14105|LOG_INFO|UMM|-
|ARCD Publisher is ENABLED
2023-04-06T02:05:54.200956+00:00 EdgeInt arcd[3009]: Event|14101|LOG_INFO|UMM|-
|App Recognition feature has been ENABLED
2023-04-06T03:56:32.352900+00:00 EdgeInt arcd[2700]: Event|14108|LOG_INFO|UMM|-|IP
Flow table utilization back to lower threshold  on linecard 0
2023-04-06T03:56:32.521900+00:00 EdgeInt arcd[2700]: Event|14108|LOG_INFO|UMM|-|IP
Flow table utilization back to lower threshold  on linecard 3
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	Manager (#)	Administrators or local user group members with execution rights for this command.

show tech arc

```
show tech arc
```

Description

Shows the ARC configuration settings.

Examples

The example shows the ARC configuration settings.

```
switch# show tech arc
====================================================
Show Tech executed on Wed Jul 20 13:35:39 2022
====================================================
====================================================
[Begin] Feature arc
====================================================

*********************************
Command : show app-recognition
*********************************

  Application Recognition Global Configuration
     Configuration status  : Enabled
     Operational status    : Enabled
     Failure Reason        : NA
  Application Recognition Port Configuration
    Interface       User-config       Port-access-config      Oper-status
    -----------     -----------       ------------------      ----------
   1/5/1              Disabled            Disabled            Disabled
   1/5/2              Disabled            Disabled            Disabled
   1/5/3              Disabled            Disabled            Disabled
   1/5/4              Disabled            Disabled            Disabled
   1/5/5              Enabled             Disabled            Enabled
   1/5/6              Disabled            Disabled            Disabled
   1/5/7              Disabled            Disabled            Disabled
   1/5/8              Disabled            Disabled            Disabled
   1/5/9              Disabled            Disabled            Disabled
=======================================================================
[End] Feature arc
=======================================================================


=======================================================================
Show Tech commands executed successfully
=======================================================================
Show Tech took 5 seconds for execution
```

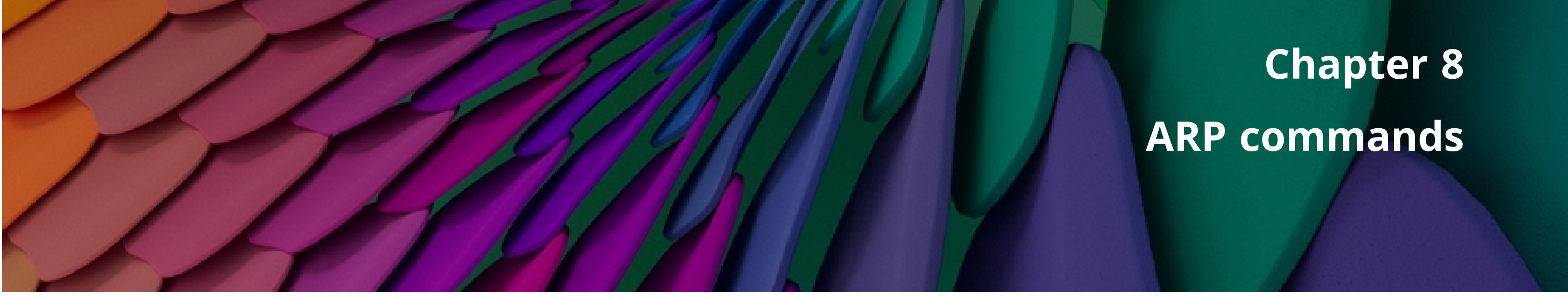
For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 8
ARP commands

arp inspection

`arp inspection`

Description

Enables Dynamic ARP inspection on the current VLAN, which means that ARP packets received from untrusted interfaces are discarded if they have an Invalid IP-to-MAC address binding.

The **no** form of this command disables Dynamic ARP Inspection on the VLAN.

Examples

Enabling dynamic ARP inspection:

```
switch# configure terminal
switch(config)# vlan 1
switch(config-vlan)# arp inspection
```

Disabling dynamic ARP inspection:

```
switch# configure terminal
switch(config)# vlan 1
switch(config-vlan)# no arp inspection
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

arp inspection trust

```
arp inspection trust
no arp inspection trust
```

Description

Configures the interface as a trusted. All interfaces are untrusted by default.

The **no** form of this command returns the interface to the default state (untrusted).

Example

Setting an interface as trusted:

```
switch(config-if)# arp inspection trust
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

arp ip

```
arp ip <IP_ADDR> mac <MAC_ADDR>
no arp ip <IP_ADDR> mac <MAC_ADDR>
```

Description

Specifies a permanent static neighbor entry in the ARP table (for IPv4 neighbors).

The no form of this command deletes a permanent static neighbor entry from the ARP table.

Parameter	Description
`ip <IP-ADDR>`	Specifies the IP address of the neighbor or the virtual IP address of the cluster in IP format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. . Range: 4096 to 131072. Default: 131072.
`mac <MAC-ADDR>`	Specifies the MAC address of the neighbor or the multicast MAC address in IANA format (**xx:xx:xx:xx:xx:xx**), where **x** is a hexadecimal number from 0 to F. Range: 4096 to 131072. Default: 131072.

Example

On the 6400 Switch Series, interface identification differs.

Configuring a static ARP entry on a interface VLAN **10**:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# arp ip 2.2.2.2 mac 01:00:5e:00:00:01
```

Removing a static ARP entry on interface VLAN**10**:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no arp ip 2.2.2.2 mac 01:00:5e:00:00:01
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if config-if-vlan	Administrators or local user group members with execution rights for this command.

arp process-grat-arp

```
arp process-grat-arp
no arp process-grat-arp
```

Description

Enables the processing of gratuitous ARP packets on the individual port or group of L3 ports together.

By default, the gratuitous ARP processing is enabled. When gratuitous ARP (GARP) processing is enabled, a switch that is advertising any changes in its MAC through the GARP will reflect in the neighbor table of the switch. However, the switch will not be able to learn the neighbor through the GARP.This configuration is applicable only on L3 interfaces such as ROPs, subinterfaces, and SVIs.

The **no** form of this command disables the processing of gratuitous ARP packets.

Example

Enabling the processing of gratuitous ARP packets on the interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no shutdown
switch(config-if)# arp process-grat-arp
```

Enabling the processing of gratuitous ARP packets on interfaces **1/1/1** to **1/1/5**:

```
switch(config)# interface 1/1/1-1/1/5
switch(config-if<1/1/1-1/1/5>)# no shutdown
switch(config-if<1/1/1-1/1/5>)# arp process-grat-arp
```

Enabling the processing of gratuitous ARP packets on sub-interface **1/1/1.10**:

Applies only to the Aruba 6300, 6400, 8100, and 8360 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# no shutdown
switch(config-subif)# arp process-grat-arp
```

Disabling the processing of gratuitous ARP packets on VLANs **2** to **100**:

```
switch(config)# interface vlan 2-100
switch(config-if-vlan<2-100>)# no shutdown
switch(config-if-vlan<2-100>)# no arp process-grat-arp
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if config-if-vlan config-subif	Administrators or local user group members with execution rights for this command.

clear arp

```
clear arp
  port <PORT-ID> [ip <A.B.C.D>|all]|[ipv6 <X:X::X:X>|all]vla
  vrf [all-vrfs|{<VRF-NAME> [ip <A.B.C.D>]|[ipv6 <X:X::X:X>]}]
```

Description

Clears IPv4 and IPv6 neighbor entries from the ARP table. If you do not specify any VRF or port parameters, ARP table entries are cleared for the **default** VRF.

Parameter	Description
`port <PORT-ID>`	Specifies a port on the switch. For example: **1/1/1**.
`ip <A.B.C.D>|all]`	(Optional) Include an IP address to clear neighbor entries for that specific address, or use the **all** parameter to clear entries for all IP addresses.
`ipv6 <X:X::X:X>|all`	(Optional) Include an IPv6 address to clear neighbor entries for that specific address, or use the **all** parameter to clear entries for all IPv6 addresses.
`vrf`	Clears IPv4 and IPv6 neighbor entries for the specified VRF or for all VRFs. If no VRF is specified he **default** VRF is cleared.
`all-vrfs`	Clear neighbor entries for all VRFs
`<VRF-NAME>`	Clear neighbor entries for the specified VRF.
`ip <A.B.C.D>`	(Optional) Include an IP address to clear just the neighbor entries for the specified IP address.
`ipv6 <X:X::X:`	(Optional) Include an IPv6 address to clear the neighbor entries for the specified IPv6 address.

Examples

Clearing all IPv4 and IPv6 neighbor ARP entries for the default VRF:

```
switch# clear arp
```

Clearing all ARP neighbor entries for a port (*On the 6400 Switch Series, interface identification differs.*):

```
switch# clear arp 1/1/35
```

Clearing all IPv4 and IPv6 neighbor ARP entries for all VRFs:

```
switch# clear arp vrf all-vrfs
```

Clearing all IPv4 and IPv6 neighbor ARP entries for a specific VRF instance:

```
switch# clear arp vrf RED
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

debug arp-security

```
debug arp-security <LOG-CATEGORY> [severity <LEVEL>]
no debug arp-security [<LOG-CATEGORY>] [severity <LEVEL>]
```

Description

Enables ARP security debug logs. If <SEVERITY> is omitted, all severities are logged.

The **no** form of this command disables ARP security debug logs.

Parameter	Description
<LOG-CATEGORY>	Selects the ARP security debug log category. Available categories are: - **all**: Selects all ARP security debug log categories. - **config**: Selects the ARP security config debug log category. - **inspection**: Selects the ARP security inspection debug log category. - **packet**: Selects the ARP security packet debug log category.
severity *<LEVEL>*	Specifies how to filter the ARP security debug logging by setting the minimum severity level for which debug logging will be performed. The selected severity level and all severities above (more severe) will be included in the logging. - **emerg**: Sets ARP security debug log filtering to Emergency only. - **alert**: Sets ARP security debug log filtering to Alert and above. - **critical**: Sets ARP security debug log filtering to Critical and above. - **error**: Sets ARP security debug log filtering to Error and above. - **warning**: Sets ARP security debug log filtering to Warning and above. - **notice**: Sets ARP security debug log filtering to Notice and above. - **info**: Sets ARP security debug log filtering to Info and above. - **debug**: Sets ARP security debug log filtering to all severities.

Examples

Enable ARP security debug logging for all categories and all severities:

```
switch# debug arp-security all
```

Enable ARP security config debug log for severity level Error and above:

```
switch# debug arp-security config severity error
```

Enable ARP security inspection debug log for severity level Notice and above:

```
switch# debug arp-security inspection severity notice
```

Enable ARP security debug packet for severity level Critical and above:

```
switch# debug arp-security packet severity critical
```

Enable ARP security debug logging for all categories and severity level Alert and above:

```
switch# debug arp-security all severity alert
```

Disable ARP security debug logging:

```
switch# no debug arp-security
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip local-proxy-arp

```
ip local-proxy-arp
no ip local-proxy-arp
```

Description

Enables local proxy ARP on the specified interface. Local proxy ARP is supported on Layer 3 physical interfaces and on VLAN interfaces. To enable local proxy ARP on an interface, routing must be enabled on that interface.

The **no** form of this command disables local proxy ARP on the specified interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling local proxy ARP on interface **1/1/1**:

```
switch# interface 1/1/1
switch(config-if)# ip local proxy-arp
```

Enabling local proxy ARP on interface VLAN **3**:

```
switch# interface vlan 3
switch(config-if-vlan)# ip local-proxy-arp
```

Disabling local proxy ARP on on interface **1/1/1**.

```
switch# interface 1/1/1
switch(config-if)# no ip local-proxy-arp
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if config-if-vlan	Administrators or local user group members with execution rights for this command.

ip proxy-arp

```
ip proxy-arp
no ip proxy-arp
```

Description

Enables proxy ARP for the specified Layer 3 interface. Proxy ARP is supported on Layer 3 physical interfaces, LAG interfaces, and VLAN interfaces. It is disabled by default. To enable proxy ARP on an interface, routing must be enabled on that interface.

The **no** form of this command disables proxy ARP for the specified interface.

Examples

Enabling proxy ARP on interface **1/1/1**:

```
switch# interface 1/1/1
switch(config-if)# ip proxy-arp
```

Enabling proxy ARP on VLAN **3**:

```
switch# interface vlan 3
switch(config-if-vlan)# ip proxy-arp
```

Enabling proxy ARP on a LAG **11**:

```
switch(config)# int lag 11
switch(config-lag-if)# ip proxy-arp
```

Disabling proxy ARP on interface 1/1/1:

```
switch# interface 1/1/1
switch(config-if)# no ip proxy-arp
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if`
	`config-if-vlan`
	`config-lag-vlan`
		Administrators or local user group members with execution rights for this command.

ipv6 neighbor mac

```
ipv6 neighbor <IPV6-ADDR> mac <MAC-ADDR>
no ipv6 neighbor <IPV6-ADDR> mac <MAC-ADDR>
```

Description

Specifies a permanent static neighbor entry in the ARP table (for IPv6 neighbors).

The **no** form of this command deletes a permanent static neighbor entry from the ARP table.

Parameter	Description
<IPV6-ADDR>>	Specifies an IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. Range: 4096 to 131072. Default: 131072.
mac *<MAC-ADDR>>*	Specifies the MAC address of the neighbor (xx:xx:xx:xx:xx:xx), where **x** is a hexadecimal number from 0 to F. Range: 4096 to 131072. Default: 131072.

Example

On the 6400 Switch Series, interface identification differs.

Creates a static ARP entry on interface **1/1/1**.

```
switch(config)# interface 1/1/1
switch(config-if)# arp ipv6 neighbor 2001:0db8:85a3::8a2e:0370:7334 mac
00:50:56:96:df:c8
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if	Administrators or local user group members with execution rights for this command.

show arp

```
show arp [vsx-peer]
```

Description

Shows the entries in the ARP (Address Resolution Protocol) table.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

This command displays information about ARP entries, including the IP address, MAC address, port, and state.

When no parameters are specified, the `show arp` command shows all ARP entries for the default VRF (Virtual Router Forwarding) instance.

Examples

```
switch# show arp

IPv4 Address     MAC                 Port         Physical Port
--------------------------------------------------------------------------------
192.168.1.2          00:50:56:96:7b:e0   vlan10        1/1/29           stale
192.168.1.3          00:50:56:96:7b:ac   vlan10        1/1/1            reachable

Total Number Of ARP Entries Listed- 2.
--------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show arp inspection interface

`show arp inspection interface [<IFNAME>] [vlan <VLAN-ID>] [vsx-peer]`

Description

Shows the current configuration of dynamic ARP inspection on an interface.

Parameter	Description
<IFNAME>	Specifies the interface.
<VLAN-ID>	Specifies the VLAN ID. Range: 1 to 4094.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing current configuration of dynamic ARP inspection on all interfaces:

```
switch# show arp inspection interface

---------------------------------------------------------------------------
Interface           Trust-State
---------------------------------------------------------------------------
1/1/1               Untrusted
---------------------------------------------------------------------------
```

Showing current configuration of dynamic ARP inspection on all interfaces with VSX peer:

```
switch# show arp inspection interface vsx-peer
---------------------------------------------------------------------------
Interface           Trust-State
---------------------------------------------------------------------------
1/1/1               Untrusted
lag100              Trusted
---------------------------------------------------------------------------
```

Showing current configuration of dynamic ARP inspection on a particular interface:

```
switch# show arp inspection interface 1/1/1

---------------------------------------------------------------------------
Interface           Trust-State
---------------------------------------------------------------------------
1/1/1               Untrusted
---------------------------------------------------------------------------
```

Showing current configuration of dynamic ARP inspection on interface VLAN 2:

```
switch# show arp inspection interface vlan 2

-----------------------------------------------------------------
Interface           Trust-State
-----------------------------------------------------------------
vlan2               Trusted
-----------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show arp inspection statistics

`show arp inspection statistics vlan [<VLAN-ID>] [vsx-peer]`

Description

Shows statistics about forwarded and dropped ARP packets. When *<VLAN-ID>* is not specified, information is shown for all configured VLANs.

Parameter	Description
<VLAN-ID>	Specifies the VLAN ID or range of IDs separated by a dash "-". Range: 1 to 4094.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing ARP packet statistics for a range of VLANs:

```
switch# show arp inspection statistics vlan 1-100

-----------------------------------------------------------------
VLAN   Name              Forwarded           Dropped
-----------------------------------------------------------------
1      DEFAULT_VLAN_1    0                   0
-----------------------------------------------------------------
```

Showing ARP packet statistics for VLANs with VSX peer:

```
switch# show arp inspection statistics vlan vsx-peer

-----------------------------------------------------------------
VLAN   Name              Forwarded           Dropped
-----------------------------------------------------------------
1      DEFAULT_VLAN_1    0                   0
200    VLAN200           0                   0
-----------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show arp inspection vlan

`show arp inspection vlan [<VLAN-ID>] [vsx-peer]`

Description

Shows the current configuration of dynamic ARP inspection on a VLAN. When *<VLAN-ID>* is not specified, information is shown for all configured VLANs.

Parameter	Description
<VLAN-ID>	Specifies the VLAN ID or range of IDs separated by a dash "–". Range: 1 to 4094.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing dynamic ARP configuration for all VLANs:

```
switch# show arp inspection vlan
------------------------------------------------------------------
VLAN   Name              ARP Inspection
------------------------------------------------------------------
1      DEFAULT_VLAN_1    -
100    VLAN100           -
200    VLAN200           Enabled
------------------------------------------------------------------
```

Showing dynamic ARP configuration for a particular VLAN:

```
switch# show arp inspection vlan 1
------------------------------------------------------------------
VLAN   Name              ARP Inspection
------------------------------------------------------------------
1      DEFAULT_VLAN_1    -
------------------------------------------------------------------
```

Showing dynamic ARP configuration for VLANs with VSX peer:

```
switch# show arp inspection vlan vsx-peer
-----------------------------------------------------------------
VLAN    Name                ARP Inspection
-----------------------------------------------------------------
1       DEFAULT_VLAN_1      -
-----------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show arp state

```
show arp state {all | failed | incomplete | permanent | reachable | stale} [vsx-peer]
```

Description

Shows ARP (Address Resolution Protocol) cache entries that are in the specified state.

Parameter	Description
`all`	Shows the ARP cache entries for all VRF (Virtual Router Forwarding) instances.
`failed`	Shows the ARP cache entries that are in `failed` state. The neighbor might have been deleted.
`incomplete`	Shows the ARP cache entries that are in `incomplete` state. An incomplete state means that address resolution is in progress and the link-layer address of the neighbor has not yet been determined. A solicitation request was sent, and the switch is waiting for a solicitation reply or a timeout.
`permanent`	Shows the ARP cache entries that are in `permanent` state. ARP entries that are in a permanent state can be removed by administrative action only.

Parameter	Description
`reachable`	Shows the ARP cache entries that are in `reachable` state, meaning that the neighbor is known to have been reachable recently.
`stale`	Shows ARP cache entries that are in `stale` state. ARP cache entries are in the `stale` state if the elapsed time is in excess of the ARP timeout in seconds since the last positive confirmation that the forwarding path was functioning properly.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show arp state failed

IPv4 Address     MAC                Port         Physical Port    State
---------------------------------------------------------------------------
192.168.1.4                         vlan10                         failed
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show arp summary

`show arp summary [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows a summary of the IPv4 and IPv6 neighbor entries on the switch for all VRFs or a specific VRF.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing summary ARP information for all VRFs:

```
switch# show arp summary all-vrfs

ARP Entry's State                : IPv4     IPv6
-------------------------------------------------------

Number of Reachable ARP entries  : 2         0

Number of Stale ARP entries      : 0         0

Number of Failed ARP entries     : 2         2

Number of Incomplete ARP entries : 0         0

Number of Permanent ARP entries  : 0         0

-------------------------------------------------------

Total ARP Entries: 6             : 4         2

-------------------------------------------------------
```

Showing a summary of all IPv4 and IPv6 neighbor entries on the primary and secondary (peer) switches:

```
vsx-primary# show arp summary
ARP Entry's State                 IPv4        IPv6
---------------------------------------------------------
Number of Reachable ARP entries   25858       32231
Number of Stale ARP entries       0           1
Number of Failed ARP entries      0           257
Number of Incomplete ARP entries  0           0
Number of Permanent ARP entries   0           0
---------------------------------------------------------
Total ARP Entries- 58347          25858       32489

vsx-primary# show arp summary vsx-peer
ARP Entry's State                 IPv4        IPv6
---------------------------------------------------------
Number of Reachable ARP entries   25858       32168
Number of Stale ARP entries       0           3
Number of Failed ARP entries      0           317
Number of Incomplete ARP entries  0           0
Number of Permanent ARP entries   0           0
---------------------------------------------------------
Total ARP Entries- 58346          25858       32488
```

```
----------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show arp timeout

`show arp timeout [<INTERFACE>] [vsx-peer]`

Description

Shows the age-out period for each ARP (Address Resolution Protocol) entry for a port, LAG, or VLAN interface.

Parameter	Description
<INTERFACE>	Specifies a physical port, VLAN, or LAG on the switch. For physical ports, use the format `member/slot/port` (for example, `1/3/1`).
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing ARP timeout information for a port:

```
switch# show arp timeout 1/1/1
ARP Timeout:

------------------

Port             VRF                               Timeout

1/1/1            default                           600
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show arp vrf

`show arp {all-vrfs | vrf <VRF-NAME>} [vsx-peer]`

Description

Shows the ARP table for all VRF instances, or for the named VRF.

Parameter	Description
`all-vrfs`	Specifies all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Length: 1 to 32 alphanumeric characters.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing ARP entries for VRF **vrf1**.

```
switch# show arp vrf vrf1

IPv4 Address     MAC                 Port          Physical Port                State
    VRF
------------------------------------------------------------------------------------
------------
100.1.250.50     00:50:56:8d:44:13   vlan1001      1/1/2
reachable   vrf1
100.2.250.60     00:50:56:8d:45:63   vlan1002      vxlan1(1920:1680:1:1::2)
permanent   vrf1

Total Number Of ARP Entries Listed: 2.
------------------------------------------------------------------------------------
------------
```

This example from a different network shows ARP entries for all VRFs.

```
switch# show arp all-vrfs
ARP IPv4 Entries:
--------------------------------------------------------
IPv4 Address    MAC                Port    Physical Port  State      VRF
192.168.120.10  00:50:56:bd:10:be  1/1/32  1/1/32         reachable  red
10.20.30.40     00:50:56:bd:6a:c5  1/1/29  1/1/29         reachable  test
--------------------------------------------------------
Total Number Of ARP Entries Listed: 2.
--------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 neighbors

`show ipv6 neighbors {all-vrfs | vrf <VRF-NAME>} [vsx-peer]`

Description

Shows entries in the ARP table for all IPv6 neighbors for all VRFs or for a specific VRF.

When no parameters are specified, this command shows all ARP entries for the default VRF, and state information for `reachable` and `stale` entries only.

Parameter	Description
`all-vrfs`	Specifies all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Length: 1 to 32 alphanumeric characters.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show ipv6 neighbors
IPv6 Entries:

-------------------------------------------------------

IPv6 Address                 MAC                Port      Physical Port  State

fe80::a21d:48ff:fe8f:2700    a0:1d:48:8f:27:00  vlan2300  1/1/31         reachable

fe80::f603:43ff:fe80:a600    f4:03:43:80:a6:00  vlan2300  1/1/30         reachable

-------------------------------------------------------

Total Number Of IPv6 Neighbors Entries Listed: 2.

-------------------------------------------------------
```

```
switch# show ipv6 neighbors vrf vrf1
IPv6 Address                                   MAC                 Port
Physical Port   State      VRF
----------------------------------------------------------------------------------
------------
1000:2:1:1::250:60   00:50:56:8d:45:63  vlan1002    vxlan1(1920:1680:1:1::2)
permanent  vrf1
1000:1:1:1::250:50   00:50:56:8d:44:13  vlan1001    1/1/2
reachable  vrf1
Total Number Of IPv6 Neighbors Entries Listed: 2.
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show ipv6 neighbors state

```
show ipv6 neighbors state {all | failed | incomplete | permanent | reachable | stale}
[vsx-peer]
```

Description

Shows all IPv6 neighbor ARP (Address Resolution Protocol) cache entries, or those cache entries that are in the specified state.

Parameter	Description
`all`	Shows all ARP cache entries.
`failed`	Shows ARP cache entries that are in `failed` state. The neighbor might have been deleted. Set the neighbor to be unreachable.
`incomplete`	Shows ARP cache entries that are in `incomplete` state. An incomplete state means that address resolution is in progress and the link-layer address of the neighbor has not yet been determined. This means that a solicitation request was sent, and you are waiting for a solicitation reply or a timeout.
`permanent`	Shows ARP cache entries that are in `permanent` state.
`reachable`	Shows ARP cache entries that are in `reachable` state, meaning that the neighbor is known to have been reachable recently.
`stale`	Shows ARP cache entries that are in `stale` state. ARP cache entries are in the `stale` state if the elapsed time is in excess of the ARP timeout in seconds since the last positive confirmation that the forwarding path was functioning properly.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show ipv6 neighbors state all

IPv6 Address                  MAC                Port     Physical Port    State
--------------------------------------------------------------------------------
100::2                        48:0f:cf:af:f1:cc  lag1     lag1
reachable
300::3                        48:0f:cf:af:33:be  vlan3    1/4/20
reachable
fe80::4a0f:cfff:feaf:f1cc     48:0f:cf:af:f1:cc  lag1     lag1
reachable
200::3                        48:0f:cf:af:33:be  1/4/11   1/4/11
reachable
fe80::4a0f:cfff:feaf:33be     48:0f:cf:af:33:be  vlan3    1/4/20
reachable

Total Number Of IPv6 Neighbors Entries Listed- 5.
---------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show tech arp-security

`show tech arp-security`

Description

Shows the output of these three commands:

- **`show arp inspection statistics vlan`**
- **`show arp inspection vlan`**
- **`show arp inspection interface`**

Examples

Showing the output of the three ARP security show commands:

```
switch(config-if)# show tech arp-security
====================================================
Show Tech executed on Mon Nov 28  09:53:54 2019
====================================================
====================================================
[Begin] Feature arp-security
====================================================


*********************************
Command : show arp inspection statistics vlan
*********************************

-----------------------------------------------------------------
VLAN   Name                 Forwarded            Dropped
-----------------------------------------------------------------
1      DEFAULT_VLAN_1       0                    0
200    VLAN200              0                    0
-----------------------------------------------------------------

*********************************
Command : show arp inspection vlan
*********************************

-----------------------------------------------------------------
VLAN   Name                 ARP-Inspection
-----------------------------------------------------------------
1      DEFAULT_VLAN_1       -
200    VLAN200              Enabled
-----------------------------------------------------------------

*********************************
Command : show arp inspection interface
*********************************
```

```
----------------------------------------------------------------------------
Interface           Trust-State
----------------------------------------------------------------------------
1/1/1               Untrusted
lag100              Trusted
----------------------------------------------------------------------------
=====================================================
[End] Feature arp-security
=====================================================


=====================================================
Show Tech commands executed successfully
=====================================================
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

Chapter 9

Aruba Intelligent Forwarding (FIB) commands

fib-optimization ageout-time

```
fib-optimization ageout-time <AGEOUT-TIME>
```

Description

Configures the host route age-out time. If a host route entry is designated for ageing, and no traffic is using the route for configured amount of age time, the host route entry will be removed form the hardware resource table. When traffic using that route resumes, the host route entry will be added back to the hardware resource table.

Host route age-out time is a global timer applicable to all types of host route entries, optimized by this feature.

Parameter	Description
<AGEOUT-TIME>	Specifies the age-out time for the route in seconds. Range: 60 to 3600 seconds. Default: 90 seconds.

Examples

Configuring the host route age-out time of 100 seconds

```
switch(config)# fib-optimization ageout-time 100
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

fib-optimization evpn-vxlan exclude-nexthop

```
fib-optimization evpn-vxlan exclude-nexthop <IP-ADDRESS>
no fib-optimization evpn-vxlan exclude-nexthop <IP-ADDRESS>
```

Description

Excludes optimization of host routes for the identified next-hop hosting destination of frequent regular traffic. Any EVPN host route pointing to the configured next hops will not be optimized by FIB optimization. A maximum of 8 exclude next-hops can be configured.

The **no** form of this command removes the exclude next-hop configuration.

Parameter	Description
<IP-ADDRESS>	Specifies the IP address of the next hop to be excluded.

Examples

Excluding optimization of host routes for the identified next-hop:

```
switch(config)# fib-optimization evpn-vxlan exclude-nexthop 8.8.8.8
```

Disabling the next-hop configuration:

```
switch(config)# no fib-optimization evpn-vxlan exclude-nexthop 8.8.8.8
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

fib-optimization evpn-vxlan host-route

```
fib-optimization evpn-vxlan host-route ip
no fib-optimization evpn-vxlan host-route ip
```

Description

Enable the FIB optimization process. This feature optimizes EVPN IPv4 host routes. In subnet stretched scenarios, after enabling FIB optimization, initial few packets are punted to CPU and traffic drop will be observed.

The **no** form of this command disables FIB optimization process.

Examples

Enabling FIB optimization:

```
switch(config)# fib-optimization evpn-vxlan host-route ip
```

Disabling FIB optimization:

```
switch(config)# no fib-optimization evpn-vxlan host-route ip
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.14	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
10.10	Command Introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show fib-optimization configuration

```
show fib-optimization configuration
```

Description

Shows the EVPN data plane route optimization configurations.

Examples

Showing the EVPN data plane route optimization configurations.:

```
switch# show fib-optimization configuration
Address family       : EVPN IPv4
Operation status     : Enabled
Route age-out time   : 100
Excluded nexthops    : 5.5.5.5 , 6.6.6.6 , 8.8.8.8
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show ip route fib-optimization

```
show ip route fib-optimization [<IP-ADDRESS>] [summary] {all-vrfs | vrf <VRF-Name>}
```

Description

Shows the EVPN host routes removed from the data plane by the FIB optimization. The host routes are removed for the data plane if no traffic is using routes for configured age-out time.

The **show ip route** command displays all routes irrespective of optimization.

Parameter	Description
`<IP-ADDRESS>`	Specifies the longest prefix match. Syntax for IPv4: A.B.C.D
`summary`	Specifies the information for all VRFs.
`all-vrfs`	Specifies the information for all VRFs.
`vrf <vrf-name>`	Speifies a VRF by VRF name (if no *<VRF-NAME>* is specified, the default VRF is implied.

Examples

Showing the FIB optimized routes for all VRFs:

```
switch# show ip route fib-optimization all-vrfs

EVPN ipv4 host routes optimized by Aruba Intelligent ForwardingEVPN ipv4 host
routes optimized by Aruba Intelligent Forwarding

Origin Codes: C - connected, S - static, L - local
R - RIP, B - BGP, O - OSPF
Type Codes: E - External BGP, I - Internal BGP, V - VPN, EV - EVPN
IA - OSPF internal area, E1 - OSPF external type 1
E2 - OSPF external type 2

VRF: red

Prefix Nexthop Interface VRF(egress) Origin/ Distance/ Age
Type Metric
---------------------------------------------------------------------------------
---------
```

```
200.200.200.2/32 3.3.3.3 - - B/EV [200/0] 00h:09m:24s
200.200.200.251/32 3.3.3.3 - - B/EV [200/0] 00h:09m:50s

Total Route Count : 2
```

Showing the FIB optimized routes for the specified VRF:

```
switch# show ip route fib-optimization vrf red

EVPN ipv4 host routes optimized by Aruba Intelligent Forwarding

Origin Codes: C - connected, S - static, L - local
R - RIP, B - BGP, O - OSPF
Type Codes: E - External BGP, I - Internal BGP, V - VPN, EV - EVPN
IA - OSPF internal area, E1 - OSPF external type 1
E2 - OSPF external type 2

VRF: red

Prefix Nexthop Interface VRF(egress) Origin/ Distance/ Age
Type Metric
----------------------------------------------------------------------------------
-
200.200.200.2/32 3.3.3.3 - - B/EV [200/0] 00h:09m:51s
200.200.200.251/32 3.3.3.3 - - B/EV [200/0] 00h:10m:17s

Total Route Count : 2
```

Showing the specific FIB optimized host route information:

```
switch# show ip route fib-optimization 100.100.100.22  vrf red

VRF: red

Prefix     : 100.100.100.22/32                       VRF(egress)        : -
Nexthop    : 3.3.3.3                                 Interface          : -
Origin     : bgp                                     Type               : bgp_evpn
Distance   : 200                                     Metric             : 0
Age        : 00h:03m:45s                             Tag                : 0
Encap Type : vxlan                                   Encap Details      :l3vni
1000
```

Showing FIB optimized routes summary for all VRFs:

```
switch# show ip route fib-optimization summary all-vrfs
IPv4 Route FIB optimization Summary

VRF name : red
Number of evpn routes optimized : 2
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

AVB commands

avb

```
avb
no avb
```

Description

Enables the AVB feature and creates the AVB context. Enables user to exercise various configuration options available under AVB.

The **no** form of this command removed the AVB configuration in the global context.

Examples

Enable AVB:

```
switch(config)# avb
switch(config-avb)#
```

Disable AVB:

```
switch(config)# no avb
AVB configuration will be deleted.
Continue (y/n)? y
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.

clear msrp statistics

`clear msrp statistics [<IF-NAME>]`

Description

Clears the MSRP counters for the given interfaces.

Parameter	Description
<IFNAME>	Specifies the interface name.

Examples

Clear the MSRP counter for interface 1/1/1:

```
switch# clear msrp statistics 1/1/1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Administrators or local user group members with execution rights for this command.

enable

```
enable
no enable
```

Description

Enables AVB globally.
The **no** form of this command disables AVB globally.

Examples

Enable audio video bridging:

```
switch(config)# avb
switch(config-avb)# enable
```

Disable audio video bridging:

```
switch(config)# avb
switch(config-avb)# no enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.

max fan in ports

```
max-fan-in-ports <NUMPORTS>
no max-fan-in-ports <NUMPORTS>
```

Description

Configures the AVB maximum number of fan in ports globally. The default maximum is 10. Whenever the max-fan-in-ports is changed, AVB disable and enable are required to make it operational.
The **no** form of this command sets the AVB maximum number of fan in ports to default.

Parameter	Description
<NUMPORTS>	Specifies the maximum number of fan in ports. Range: 1-10. Default: 10.

Examples

Enable AVB max-fan-in-ports 3:

```
switch(config)# avb
switch(config-avb)# max-fan-in-ports 3
Disable and Enable AVB to reflect max-fan-in-ports configuration as operational.
```

Disable AVB VLAN 3 max-fan-in-ports and setting to default:

```
switch(config)# avb
switch(config-avb)# no max-fan-in-ports 3
Disable and Enable AVB to reflect max-fan-in-ports configuration as operational.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.

msrp

```
msrp
no msrp
```

Description

Configures the MSRP protocol on the interface
The **no** form of this command disables the MSRP protocol on the interface.

Examples

Enable MSRP protocol on the interface:

```
switch(config-if)# msrp
```

Disable MSRP protocol on the interface:

```
switch(config-if)# no msrp
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights for this command.

msrp timer join

```
msrp timer join <TIME-INTERVAL>
no msrp timer join <TIME-INTERVAL>
```

Description

Configures the MSRP join timer on a MSRP enabled interface. The timer configures the time to wait for the MSRP Protocol Data Units (PDUs) to be sent out of the interface. The timer units are in centiseconds. The default is 20 centiseconds.
The **no** form of this command sets the configuration back to the default value.

Parameter	Description
<TIME-INTERVAL>	Specifies the time interval in centiseconds. Range: 20-100. Default: 20.

Examples

Configure MSRP timer join to 50 centiseconds:

```
switch(config-if)# msrp timer join 50
```

Remove MSRP timer join configuration and set to default timers:

```
switch(config-if)# no msrp timer join 50
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights for this command.

msrp timer leave

```
msrp timer leave <TIME-INTERVAL>
no msrp timer leave <TIME-INTERVAL>
```

Description

Configures the MSRP leave timer on a MSRP enabled interface. The timer configures the time to wait for the MSRP registrar state to move from LEAVE state to EMPTY state on the interface. The timer units are in centiseconds. The default is 300 centiseconds.
The **no** form of this command sets the configuration back to the default value.

Parameter	Description
<TIME-INTERVAL>	Specifies the time interval in centiseconds. Range: 40-1000000. Default: 300.

Examples

Configure MSRP timer leave to 500 centiseconds:

```
switch(config-if)# msrp timer leave 500
```

Remove MSRP timer leave configuration and set to the default configuration:

```
switch(config-if)# no msrp timer leave 500
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights for this command.

msrp timer leaveall

```
msrp timer leaveall <TIME-INTERVAL>
no msrp timer leaveall <TIME-INTERVAL>
```

Description

Configures the MSRP leaveall timer on a MSRP enabled interface. The timer configures the time to wait for the leaveall messages to be sent on the interface. The timer units are in centiseconds. The default is 1000 centiseconds.
The **no** form of this command sets the configuration back to the default value.

Parameter	Description
<TIME-INTERVAL>	Specifies the time interval in centiseconds. Range: 500-1000000. Default: 1000.

Examples

Configure MSRP leaveall timer to 500 centiseconds:

```
switch(config-if)# msrp timer leaveall 500
```

Remove MSRP leaveall timer configuration and set to default configuration:

```
switch(config-if)# no msrp timer leaveall 500
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights for this command.

show avb domain

```
show avb domain
```

Description

Displays the global AVB domain status.

Examples

Display the global AVB domain status:

```
switch# show avb domain
AVB state                           : operational
AVB VLAN                            : 2
Max Fan in Ports                    : 10
AVB Class-A
        Priority Code Point         : 3
        Number of Core Ports        : 1
        Number of Boundary Ports    : 1
AVB Class-B
        Priority Code Point         : 2
        Number of Core Ports        ; 1
        Number of Boundary Ports    : 1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (`#`)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show avb interface

`show avb interface [<IFNAME> | brief]`

Description

Displays the AVB interface information.

Parameter	Description
<IFNAME>	Specifies the interface name.
`brief`	Shows information in brief format.

Examples

Display the AVB interface status:

```
switch# show avb interface 1/1/2
AVB state                         : Enabled
MSRP State                        : Enabled
PTP State                         : Enabled, asCapable
  Neighbor Propogation Delay      : 98
  Port State                      : clock_source
  Peer Mean Path Delay            : 99
AVB readiness state               : operational
Allocated BW (Kbit/s)             : 7500000
Used BW (Kbits/s)                 : 27456
Available BW (Kbits/s)            : 7472544
Per-class value                   Class-A                Class-B
-----------------------------------------------------------------
Tx srClassVID                     2                      2
Rx srClassVID                     2                      2
Tx PCP                            3                      2
Rx PCP                            3                      -
Domain State                      Core                   Boundary
```

Display the AVB interface status in brief:

```
switch# show avb interface brief
Ethernet     Peer PCP      Peer    AVB Core       Allocated       Available
Used
Interface    A | B         VLAN    A | B          (Kbit/s)        (Kbit/s)
(Kbit/s)
----------------------------------------------------------------------------------
---------
1/1/1        3 | 2         2       YES | YES      0               0
0
1/1/2        3 | 2         2       YES | NO       7500000         7472544
27456
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show msrp interface

`show msrp interface [<IFNAME> | brief]`

Description

Displays MSRP interface information.

Parameter	Description
<IFNAME>	Specifies the interface name.
brief	Shows information in brief format.

Examples

Display the MSRP interface 1/1/1 information:

```
switch# show msrp interface 1/1/1
Stream  Id                : 00:11:01:00:00:01:00:01
Stream  Age               : N/A
Peer Participant         : Talker
Registration Attribute
Type                  : Talker-advertise
Registrar State       : Registered(IN)
Last registered Event : JoinIn
Declaration Attribute
Type                  : Listener-ready
Applicant State       : Quiet Active(QA)
Last Declared Event   : JoinIn
Declared Failure Info : N/A
```

Display the MSRP interface 1/1/2 information in brief:

```
switch# show msrp interface 1/1/2 brief
Stream-Id                Peer        Applicant  Registrar  Reservation
Failure
                         Participant State      State      Status
-----------------------------------------------------------------------------------
---------
00:11:01:00:00:01:00:01  Listener    qa         in         Reserved
N/A
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show msrp statistics

```
show msrp statistics [<IF-NAME>]
```

Description

Displays the MSRP statistics for MSRP enabled interfaces.

Parameter	Description
<IFNAME>	Specifies the interface name.

Examples

Display the MSRP interface 1/1/1 statistics:

```
switch# show msrp statistics 1/1/1
Total PDU Transmitted : 7029
Total PDU Received    : 7036
Leaveall Tx count     : 2242
Leaveall Rx count     : 2260
Domain Tx count       : 2242
Domain Rx count       : 4908

                 TALKER-ADV    TALKER-FAILED    LISTENER-ASKING-FAILED      LISTENER-READY-FAILED
LISTENER-READY
Rx-New             0             3                   0                    0
      0
Rx-In              0             0                   0                    0
0
Rx-Empty           0             0                   0                    0
      0
Rx-JoinEmpty    6545             0                   0                    0
      0
Rx-JoinIn       7170             0                   0                    0
0
Rx-Leave           3             0                   0                    0
      0
Tx-New             0             0                   2                    0
6
Tx-In              0             0                   0                    0
 0
Tx-Empty           0             0                   0                    0
0
Tx-JoinEmpty       0             0                  79                    0
   6367
Tx-joinIn          0             0                 105                    0
7170
Tx-Leave           0             0                   0                    0
      3
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show msrp state

```
show msrp state <STREAM-ID>
```

Description

Displays all information about a given stream.

Parameter	Description
<STREAM-ID>	Specifies the Stream ID.

Examples

Display the MSRP stream information:

```
switch# show msrp state 00:11:01:00:00:01:00:01
Stream-ID              : 00:11:01:00:00:01:00:01
Stream Talker Port     : 1/1/32
Stream Creation time: 1 minute
Destination MAC        : 91:e0:f0:00:fe:00
VLAN                   : 2
Priority               : 3 (class-A)
Rank                   : low
Accumulated Latency : 20 ns
Max frame size         : 100
Max frame interval     : 1 (frames/125 us)
Bandwidth              : 9152 (Kbit/s)
Status                 : active
Failure Information : N/A
Failure Bridge         : N/A
----------------------------------------------------------------------------------
---------
Port    Reg     Appl    Peer          Reg                   Decl                 Rsvn
        State   State   Participant   Attribute             Attribute
status
```

```
-----------------------------------------------------------------------------------
---------
1/1/31   in    qa    listener      listener_ready       talker_advertise
Reserved
1/1/32   in    qa    talker        talker_advertise     listener_ready       N/A
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show msrp streams

`show msrp streams`

Description

Displays all information about MSRP streams.

Examples

Display the MSRP stream information:

```
switch# show msrp streams
Stream-Id                DMAC               VLAN  Priority Rank Accumulated
                                                  (class)       Latency
        Bandwidth   Status    Talker Port
        (Kbit/s)
-----------------------------------------------------------------------------------
---------
00:11:01:00:00:01:00:01  91:e0:f0:00:fe:00  2     3 (A)    low  150020
        9152        active    1/1/1
00:11:01:00:00:01:00:05  91:e0:f0:00:fe:02  2     3 (A)    low  150020
        9152        active    1/1/1
00:11:01:00:00:01:00:03  91:e0:f0:00:fe:01  2     3 (A)    low  150020
        9152        active    1/1/1

Note: One extra byte (per packet) is considered (to offset the clock diff from the
neighbor device) for MSRP stream bandwidth.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show msrp streams statistics

```
show msrp streams statistics
```

Description

Displays the traffic statistics for all streams.

Examples

Display the MSRP traffic statistics:

```
switch# show msrp streams statistics
Stream-Id                DMAC               Class     In Packets   Drop Packets
      In Bytes     Drop bytes
----------------------------------------------------------------------------------
---------
00:11:01:00:00:01:00:01  91:e0:f0:00:fe:00  3 (A)              0              0
               0            0
00:11:01:00:00:01:00:05  91:e0:f0:00:fe:02  3 (A)              0              0
               0            0
00:11:01:00:00:01:00:03  91:e0:f0:00:fe:01  3 (A)              0              0
               0            0
Note: The drop counters are pointing to the ACL drops associated to a given
stream.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config avb

```
show running-config avb
```

Description

Displays all configured commands under the AVB context.

Examples

Display configured commands under the AVB context:

```
switch# show running-config avb
avb
        enable
        vlan 3
        max-fan-in-ports 4
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

vlan

```
vlan <VLAN ID>
no vlan <VLAN ID>
```

Description

Configures the AVB VLAN globally. The default AVB VLAN is 2. Whenever the VLAN is changed, AVB disable and enable are required to make it operational.
The **no** form of this command sets the AVB VLAN to default.

Parameter	Description
<VLAN ID>	Specifies the VLAN. Range: 1-4094. Default: 2.

Examples

Enable AVB VLAN 3:

```
switch(config)# avb
switch(config-avb)# vlan 3
Disable and Enable AVB to reflect VLAN configuration as operational.
```

Disable AVB VLAN 3 and setting to default:

```
switch(config)# avb
switch(config-avb)# no vlan 3
Disable and Enable AVB to reflect VLAN configuration as operational.
```

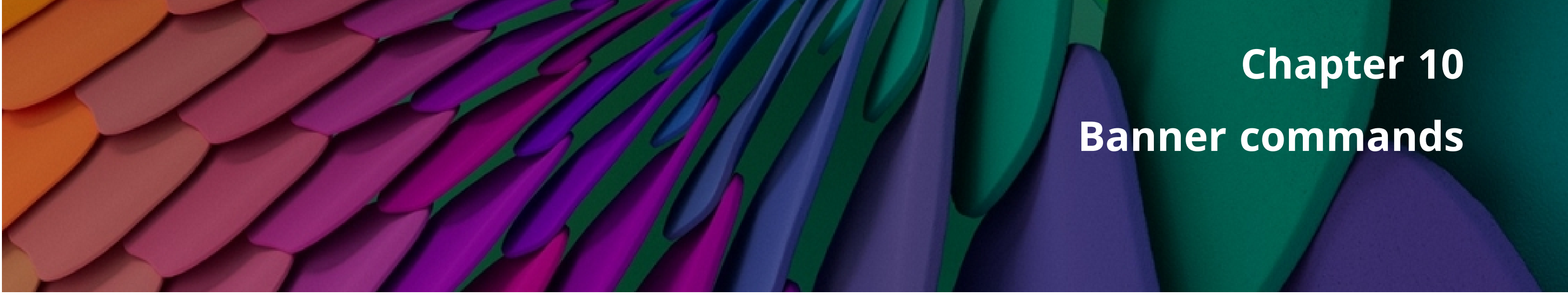
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13.1000	Featured introduced.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.



Chapter 10

Banner commands

banner

```
banner {motd | exec} <DELIMITER>
no banner {motd | exec} <DELIMITER>
```

Description

Enables the customization of the MOTD or the EXEC banner.

The **no** form of this command disables the MOTD or the EXEC banner.

Command context

`config`

Parameter	Description
`motd`	Configures the banner shown before the login prompt.
`exec`	Configures the banner shown after a successful login.
`<DELIMITER>`	Specifies the character used to terminate the input string.

Authority

Administrators or local user group members with execution rights for this command.

Usage

This command enables the customization of two types of banners:

- The MOTD banner. The banner displayed on attempting to connect to a management interface.
- The EXEC banner. The banner displayed upon successful authentication.

You can create a banner that spans multiple lines. The maximum length of a banner is 4,095 characters. This requirement includes any non-visible characters. The minimum number of characters allowed is an empty string, which displays no banner.

End the banner text with a chosen delimiter character. A delimiter character can be any non-whitespace character that does not have special meaning to the CLI, such as the caret (^). A question mark (?) is not permitted. Question marks can however be included as part of the banner text.

Examples

Configuring the banner displayed before login:

```
switch(config)# banner motd ^
Enter a new banner. Terminate the banner with the delimiter you have chosen.
(banner-motd)# This is an example of a banner text which a connecting user
```

```
(banner-motd)# will see before they are prompted for their password.
(banner-motd)#
(banner-motd)# As you can see it may span multiple lines and the input
(banner-motd)# will be terminated when the delimiter character is
(banner-motd)# encountered.^
```

Configuring the banner displayed after a successful login:

```
switch(config)# banner exec &
Enter a new banner. Terminate the banner with the delimiter you have chosen.
(banner-motd)# This is an example of different banner text. This time
(banner-motd)# the banner entered will be displayed after a user has
(banner-motd)# authenticated.
(banner-motd)#
(banner-motd)# & This text will not be included because it comes after the &
```

Disabling the MOTD banner:

```
switch(config)# no banner motd ^
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show banner

`show banner {motd | exec} [vsx-peer]`

Description

Shows the MOTD or EXEC banner message.

Parameter	Description
`motd`	Shows the banner displayed before the login prompt.
`exec`	Shows the banner displayed after a successful login.
`[vsx-peer]`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing the MOTD banner displayed before the login prompt:

```
switch(config)# show banner motd
This is an example of a banner text which a connecting user
will see before they are prompted for their password.

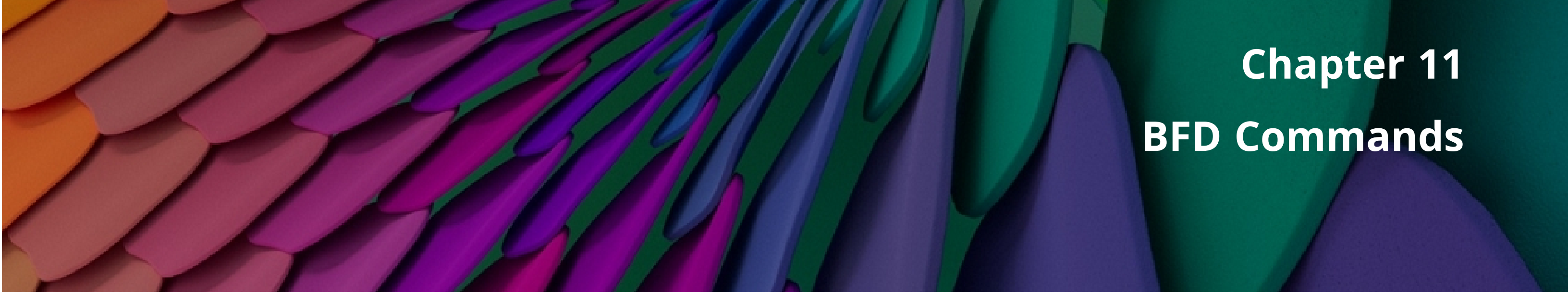
As you can see it may span multiple lines and the input
will be terminated when the delimiter character is
encountered.
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 11
BFD Commands

bfd

```
bfd
no bfd
```

Description

Enables BFD support on the switch. BFD is disabled by default.

The **no** form of this command disables BFD and removes all related configuration settings. To disable BFD, but retain configuration settings, use the command bfd disable.

Examples

Enabling BFD support:

```
switch(config)# bfd
```

Disabling BFD support and removing all configuration settings:

```
switch(config)# no bfd
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

bfd *<IPV4-ADDR>*

```
bfd <IPV4-ADDR>
no bfd <IPV4-ADDR>
```

Description

Enables BFD under VRRP for the specified IP address. BFD is asynchronous and echo mode is supported.

The **no** form of this command disables BFD under VRRP for the specified IP address.

Parameter	Description
<IPV4-ADDR>	Specifies the address on which to enable BFD in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling BFD on the address **10.0.0.1** on VRRP **1**:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# vrrp 1 address-family ipv4
switch(config-if-vrrp)# bfd 10.0.0.1
```

Disabling BFD on the address **10.0.0.1** on VRRP **1**:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# vrrp 1 address-family ipv4
switch(config-if-vrrp)# no bfd 10.0.0.1
```

For more information on features that use this command, refer to the High Availability Guide or IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if-vrrp	Administrators or local user group members with execution rights for this command.

bfd all-interfaces

```
bfd all-interfaces
no bfd all-interfaces
```

Description

Enables BFD on all OSPFv2 or OSPFv3 interfaces.

The **no** form of this command disables BFD on all active OSPFv2/OSPFv3 or IPv4/IPv6 interfaces, excluding those on which BFD was enabled at the interface level with the commands `ip ospf bfd` and `ipv6 ospfv3 bfd`.

Examples

Enabling BFD on all OSPFv2 interfaces:

```
switch(config)# router ospf 1
switch(config-ospf-1)# bfd all-interfaces
```

Disabling BFD on all OSPFv2 interfaces:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no bfd all-interfaces
```

Enabling BFD on all OSPFv3 interfaces:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# bfd all-interfaces
```

Disabling BFD on all OSPFv3 interfaces:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no bfd all-interfaces
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-ospf-<INSTANCE-TAG>`
	`config-ospfv3-<INSTANCE-TAG>`
		Administrators or local user group members with execution rights for this command.

bfd detect-multiplier

```
bfd detect-multiplier <MULTIPLIER>
no bfd detect-multiplier <MULTIPLIER>
```

Description

Sets BFD detection multiplier on an interface.

The **no** form of this command removes the configured BFD detection multiplier.

Parameter	Description
<MULTIPLIER>	Specifies the BFD detection multiplier. Range: 1 to 5. Default: 5.

Examples

Setting the BFD detection multiplier to **3**:

```
switch(config-if)# bfd detect-multiplier 3
```

Removing the BFD detection multiplier:

```
switch(config-if)# no bfd detect-multiplier 3
```

Setting the BFD detection multiplier to the default value:

```
switch(config-if)# no bfd detect-multiplier
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

bfd disable

`bfd disable`

Description

Disables BFD on the switch, but retains all configuration settings.

Examples

Disabling BFD:

```
switch(config)# bfd disable
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

bfd enable (Context: config-hsc)

```
switch(config-hsc)# bfd enable
switch(config-hsc)# no bfd enable
```

Description

Enables or disables BFD for HSC feature.

Usage

BFD must be enabled globally to work for HSC.

Examples

Enabling BFD support for HSC:

```
switch(config)# hsc
switch(config-hsc)# bfd enable
```

Disabling BFD support for HSC:

```
switch(config)# hsc
switch(config-hsc)# no bfd enable
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

bfd disable (Context: config-hsc)

```
switch(config-hsc)# bfd disable
```

Description

Disables BFD for HSC feature.

Example

Disabling BFD support for HSC:

```
switch(config)# hsc
switch(config-hsc)# bfd disable
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

bfd echo disable

```
bfd echo disable
no bfd echo disable
```

Description

Disables support for BFD echo packets. Echo packet support is enabled by default.

The **no** form of this command enables support for BFD echo packets.

BFD IPv6 Echo is not supported.

Authority

Examples

On the 6400 Switch Series, interface identification differs.

Enabling BFD echo packet support on all interfaces:

```
switch(config)# no bfd echo disable
```

Disabling BFD echo packet support on all interfaces:

```
switch(config)# bfd echo disable
```

Enabling BFD echo packet support on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# bfd echo disable
```

Disabling BFD echo packet support on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no bfd echo disable
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-if`	Administrators or local user group members with execution rights for this command.

bfd echo-src-ip-address

```
bfd echo-src-ip-address <IPV4-ADDR>
no bfd echo-src-ip-address <IPV4-ADDR>
```

Description

Sets the source IPv4 address for BFD echo packets. This address is used in all echo sessions.

The source IP address must not be on the same network segment as any switch interface, otherwise a large number of ICMP redirect packets may be sent by the remote device, causing network congestion.

The **no** form of this command removes the source IPv4 address for BFD echo packets, which causes the switch to stop sending echo packets. When a valid value is set, all sessions with a peer that is capable of receiving echo packets, will start transmitting echo packets. BFD control sessions continue to run concurrently with echo packets.

Parameter	Description
<IPV4-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Examples

Setting the source IP address to **198.51.100.1**:

```
switch(config)# bfd echo-src-ip-address 198.51.100.1
```

Removing the source IP address **198.51.100.1**:

```
switch(config)# no bfd echo-src-ip-address 198.51.100.1
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

bfd min-echo-receive-interval

```
bfd min-echo-receive-interval <INTERVAL>
no bfd min-echo-receive-interval <INTERVAL>
```

Description

Sets the minimum time interval between received BFD echo packets.

The **no** form of this command removes the configured BFD echo packets interval. If the interval is not set, the default interval is used.

BFD IPv6 Echo is not supported.

Parameter	Description
<INTERVAL>	Specifies the minimum reception interval in milliseconds. A value of 0 means that the switch does not support reception of BFD echo packets. Range: 0, 50 to 1000. Default: 500.

Examples

Setting the minimum reception interval to **1000** milliseconds:

```
switch(config)# bfd min-echo-receive-interval 1000
```

Removing the minimum reception interval:

```
switch(config)# no bfd min-echo-receive-interval 1000
```

Setting the minimum reception interval to the default value:

```
switch(config)# no bfd min-echo-receive-interval
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

bfd min-receive-interval

```
bfd min-receive-interval <INTERVAL>
no bfd min-receive-interval <INTERVAL>
```

Description

Sets the minimum time interval between received BFD control packets on an interface.

The **no** form of this command removes the configured BFD minimum interval on an interface. If the interval is not set, the default interval is used.

Parameter	Description
<INTERVAL>	Specifies the minimum receive interval in milliseconds. A value of 0 means that the switch does not support reception of BFD control packets. Range: 500 to 20000. Default: 3000.

Examples

Setting the minimum receive interval to **1000** milliseconds:

```
switch(config-if)# bfd min-receive-interval 1000
```

Removing the minimum receive interval:

```
switch(config-if)# no bfd min-receive-interval 1000
```

Setting the minimum receive interval to the default value:

```
switch(config-if)# no bfd min-receive-interval
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

bfd min-transmit-interval

```
bfd min-transmit-interval <INTERVAL>
no bfd min-transmit-interval <INTERVAL>
```

Description

Sets the minimum time interval between transmitted BFD control packets on an interface.

The **no** form of this command removes the configured BFD minimum transmitted interval on an interface. If the interval is not set, the default interval is used.

Parameter	Description
<INTERVAL>	Specifies the minimum transmit interval in milliseconds. Range: 500 to 20000 Default: 3000.

Usage

- If the minimum time interval is set between 500 ms and 1000 ms, then `bfd detect-multiplier` must be set to at least 3.
- If **bfd detect-multiplier** is set to 1, then the minimum transmit interval must be set to at least 3000 ms.
- Whenever the minimum time interval is set to a value less than 1000 ms, BFD automatically adjusts the transmission interval to 1000 ms if any of the following conditions apply:
  - The session is operating in asynchronous mode and echo is enabled.
  - The session state is in any other state than `up`.

As described in RFC 5880, this behavior occurs because BFD echo provides quick detection which allows the BFD asynchronous session to lower its traffic/resource requirements.

BFD IPv6 Echo is not supported.

Examples

Setting the minimum transmit interval to **500** ms:

```
switch(config-if)# bfd min-transmit-interval 500
```

Removing the minimum transmit interval:

```
switch(config-if)# no bfd min-transmit-interval 500
```

Setting the minimum transmit interval to the default value:

```
switch(config-if)# no bfd min-transmit-interval
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

clear bfd statistics

`clear bfd statistics [session <ID>]`

Description

Clears statistics for all BFD sessions or for a specific BFD session.

Parameter	Description
`session <ID>`	Specifies a session ID.

Examples

Clearing statistics for all BFD sessions:

```
switch# clear bfd statistics
```

Clearing statistics for BFD session 1:

```
switch# clear bfd statistics session 1
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

ip ospf bfd

```
ip ospf bfd
no ip ospf bfd
```

Description

Enables BFD for OSPFv2 on the current interface. The interface must have OSPFv2 enabled on it. This overrides the global settings defined with the command **bfd all-interfaces**.

The **no** form of this command sets the current interface to the global settings defined with the command **bfd all-interfaces**.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling BFD on interface `1/1/1`:

```
switch(config)# interface 1/1/1
switch(config-if)# ip ospf bfd
```

Disabling BFD on interface `1/1/1`:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip ospf bfd
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

ip ospf bfd disable

`ip ospf bfd disable`

Description

Disables BFD for OSPFv2 on the current interface. This overrides the global settings defined with the command **bfd all-interfaces**.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling BFD on interface `1/1/1`:

```
switch(config)# interface 1/1/1
switch(config-if)# ip ospf bfd disable
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

ip route bfd

```
ip route <DEST-IPV4-ADDR>/<NETMASK> [<NEXT-HOP-IP-ADDR> | <INTERFACE>] [bfd]
no ip route <DEST-IPV4-ADDR>/<NETMASK> [<NEXT-HOP-IP-ADDR> | <INTERFACE>] [bfd]
```

Description

Enables or disables BFD on the specified static route. To disable BFD, issue the command without the `bfd` option.

Parameter	Description
<DEST-IPV4-ADDR>	Specifies a route destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<NETMASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
<NEXT-HOP-IP-ADDR>	Specifies the next hop address for reaching the destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<INTERFACE>	Specifies the next hop as an outgoing interface.
`bfd`	Enables BFD on the static route. Omit this parameter to disable BFD.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling BFD on a static route:

```
switch(config)# interface 1/1/1
switch(config-if)# ip address 20.1.1.2/24
switch(config-if)# no shutdown
switch(config-if)# routing
switch(config-if)# exit
switch(config)# ip route 192.0.0.0/8 20.1.1.1 bfd
```

Disabling BFD on a static route:

```
switch(config)# ip route 192.0.0.0/8 20.1.1.1
```

For more information on features that use this command, refer to the High Availability Guide or IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 bfd

```
ipv6 ospfv3 bfd
no ipv6 ospfv3 bfd
```

Description

Enables BFD for OSPFv3 on the current interface. The interface must have OSPFv3 enabled on it. This overrides the global settings defined with the command **bfd all-interfaces**.

The **no** form of this command sets the current interface to the global settings defined with the command **bfd all-interfaces**.

Examples

Enabling BFD:

```
switch(config-if)# ipv6 ospfv3 bfd
```

Disabling BFD:

```
switch(config-if)# no ipv6 ospfv3 bfd
```

Enabling BFD on a subinterface:

```
switch(config-subif)# ipv6 ospfv3 bfd
```

Disabling BFD on a subinterface:

```
switch(config-subif)# no ipv6 ospfv3 bfd
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 bfd disable

`ipv6 ospfv3 bfd disable`

Description

Disables BFD on the current OSPFv3 interface. This overrides the global settings defined with the command bfd all-interfaces.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling BFD on interface `1/1/1` :

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# ipv6 ospfv3 bfd disable
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

neighbor fall-over bfd

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} fall-over bfd
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} fall-over bfd
```

Description

Enables BGP to register with BFD to receive fast peering session deactivation messages from BFD.

The **no** form of this command disables BGP for BFD.

BFD is supported with IPv6 neighbors on the 6300, 6400, , , , , , , and switch series.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<PEER-GROUP-NAME>	Specifies a peer group.

Examples

```
switch(config-router)# neighbor 1.1.1.1 fall-over
switch(config-router)# no neighbor 1.1.1.1 fall-over bfd
```

```
switch(config-router)# neighbor PG fall-over
switch(config-router)# no neighbor PG fall-over bfd
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router`	Administrators or local user group members with execution rights for this command.

show bfd

```
show bfd [session <ID>] [all-vrfs | vrf <NAME>] [vsx-peer]
```

Description

Shows information for all BFD sessions or for a specific BFD session.

Parameter	Description
`session <ID>`	Session ID.
`all-vrfs`	All VRFs.
`vrf <NAME>`	Specifies the name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Possible values for **State** are:

- Up
- Down
- AdminDown
- Init

Possible values for **Local diagnostic** and **Remote diagnostic** are:

- Control detection time expired (1): The session has stopped receiving BFD control packets from the peer after one detection time.
- Echo function failed: The session has stopped receiving BFD Echo packets, so the session was declared Down.
- Neighbor signaled session down: A packet from the peer was received with either AdminDown or Down state.
- Forwarding plane reset: Not set in this release.
- Path down: The forwarding path when Down.
- Concatenated path down: Not set in this release.
- Administratively down: The administrator has disabled BFD.
- Reverse concatenated path down: Not set in this release.

BFD IPv6 Echo is not supported.

Examples

Showing information for all BFD sessions:

```
switch# show bfd

Admin status : Enabled
Echo source IP : 2.2.2.2
Statistics:
Total Number of Control Packets Transmitted : 42
Total Number of Control Packets Received : 42
Total Number of Control Packets Dropped : 0

Session Interface VRF       Source IP                       Destination IP
         Echo     State    Application
------- --------- --------- ------------------------------- ----------------------
--------- -------- -------- ------------
1       vlan10    blue      10.10.10.1                      10.10.10.2
         disabled up       ospf
1       vlan10    blue      N/A                             10.10.10.2
         disabled up       static_routes
2       vlan40    red       40.10.10.1                      40.10.10.2
         disabled up       ospf
3       vlan30    red       30.10.10.1                      30.10.10.2
         disabled up       ospf
4       vlan20    blue      20.10.10.1                      20.10.10.2
         disabled up       ospf
5       vlan50    black     50.10.10.1                      50.10.10.2
         disabled up       ospf
6       vlan60    black     60.10.10.1                      60.10.10.2
         disabled up       ospf
7       vlan10    blue      fe80::409:7380:a62:2400
fe80::409:7380:a49:a200         disabled up       ospfv3

Admin status : Enabled
Echo source IP : 2.2.2.2
Statistics:
Total Number of Control Packets Transmitted : 42
Total Number of Control Packets Received : 42
Total Number of Control Packets Dropped : 0

Session Interface VRF       Source IP                       Destination IP
         Echo     State    Application
------- --------- --------- ------------------------------- ----------------------
--------- -------- -------- ------------
1       vlan10    blue      10.10.10.1                      10.10.10.2
         disabled up       ospf
1       vlan10    blue      N/A                             10.10.10.2
         disabled up       static_routes
2       vlan40    red       40.10.10.1                      40.10.10.2
         disabled up       ospf
3       vlan30    red       30.10.10.1                      30.10.10.2
         disabled up       ospf
4       vlan20    blue      20.10.10.1                      20.10.10.2
         disabled up       ospf
5       vlan50    black     50.10.10.1                      50.10.10.2
         disabled up       ospf
6       vlan60    black     60.10.10.1                      60.10.10.2
         disabled up       ospf
7       vlan10    blue      fe80::409:7380:a62:2400
fe80::409:7380:a49:a200         disabled up       ospfv3
```

Showing information for BFD session 1:

```
switch# show bfd session 1
BFD Session Information - Session 1
VRF: blue
Min Tx Interval (msec) : 10000
Min Rx Interval (msec) : 10000
Min Echo Rx Interval (msec) : 700
Detect Multiplier : 3
Application : ospf
Local Discriminator : 1
Remote Discriminator : 1
Echo : Enabled
Local Diagnostic : no_diagnostic
Remote Diagnostic: administratively_down
State flaps: 0
Interface Source IP       Destination IP  State      Pkt In   Pkt Out  Pkt Drop
--------- --------------- --------------- ---------- -------- -------- --------
1/1/1     100.100.100.100 100.100.100.101 Up         100      101      0
BFD Session Information - Session 1
VRF: blue
Min Tx Interval (msec) : 10000
Min Rx Interval (msec) : 10000
Min Echo Rx Interval (msec) : 700
Detect Multiplier : 3
Application : ospf
Local Discriminator : 1
Remote Discriminator : 1
Echo : Enabled
Local Diagnostic : no_diagnostic
Remote Diagnostic: administratively_down
State flaps: 0
Interface Source IP       Destination IP  State      Pkt In   Pkt Out  Pkt Drop
--------- --------------- --------------- ---------- -------- -------- --------
1/1/1     100.100.100.100 100.100.100.101 Up         100      101      0
```

Showing information for all BFD sessions related to a particular VRF in the system:

```
switch# show bfd vrf blue

Admin status: enabled
Echo source IP: 100.1.1.1
Statistics:
Total number of control packets transmitted: 2226
Total number of control packets received: 2222
Total number of control packets dropped: 0
Session Interface VRF       Source IP                       Destination IP
         Echo     State    Application
------- --------- --------- ------------------------------- ----------------------
--------- -------- -------- ------------
1       vlan10    blue      10.10.10.1                      10.10.10.2
         disabled up       ospf
1       vlan10    blue      N/A                             10.10.10.2
         disabled up       static_routes
4       vlan20    blue      20.10.10.1                      20.10.10.2
         disabled up       ospf
7       vlan10    blue      fe80::409:7380:a62:2400
fe80::409:7380:a49:a200         disabled up       ospfv3
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

show bfd interface

```
show bfd interface <NAME>
```

Description

Shows information for all BFD sessions related to the specified interface.

Parameter	Description
`interface <NAME>`	Specifies an interface.

BFD IPv6 Echo is not supported.

Examples

Showing information for all BFD sessions related to the specified interface:

```
switch# show bfd interface vlan10

BFD session information - Session 1
Min Tx interval (msec): 3000
Min Rx interval (msec): 3000
Min echo Rx interval (msec): 500
Detect multiplier: 5
Application: ospf
Local discriminator: 13211
Remote discriminator: 13211
Echo: disabled
Local diagnostic: no_diagnostic
Remote diagnostic: no_diagnostic
State flaps: 0
Interface Source IP                               Destination IP
       State        Pkt Rx   Pkt Tx   Pkt drop
--------- --------------------------------------- --------------------------------
------- ------------ -------- -------- --------
vlan10    10.10.10.1                              10.10.10.2
       up           453      455      0

===============================================
BFD session information - Session 1
```

```
Min Tx interval (msec): 3000
Min Rx interval (msec): 3000
Min echo Rx interval (msec): 500
Detect multiplier: 5
Application: static_routes
Local discriminator: 13211
Remote discriminator: 13211
Echo: disabled
Local diagnostic: no_diagnostic
Remote diagnostic: no_diagnostic
State flaps: 0
Interface Source IP                               Destination IP
       State        Pkt Rx   Pkt Tx   Pkt drop
--------- --------------------------------------- --------------------------------
------- ------------ -------- -------- --------
vlan10    N/A                                     10.10.10.2
       up           453      455      0

===============================================
BFD session information - Session 7
Min Tx interval (msec): 3000
Min Rx interval (msec): 3000
Min echo Rx interval (msec): 500
Detect multiplier: 5
Application: ospfv3
Local discriminator: 1402
Remote discriminator: 1402
Echo: disabled
Local diagnostic: no_diagnostic
Remote diagnostic: no_diagnostic
State flaps: 0
Interface Source IP                               Destination IP
       State        Pkt Rx   Pkt Tx   Pkt drop
--------- --------------------------------------- --------------------------------
------- ------------ -------- -------- --------
vlan10    fe80::409:7380:a62:2400                 fe80::409:7380:a49:a200
       up           58       58       0
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show hsc

```
show hsc
```

Description

Displays connection information for the remote controller.

Example

Displaying connection information for the remote controller:

```
switch# show hsc

BFD status : Enabled

Controller IP   Port    Connection Connection
address                 status     state
--------------- ------- ---------- -------------
192.168.16.17   6640    UP         ACTIVE
192.168.16.17   6650    UP         IDLE
192.168.16.17   6660    DOWN       BACKOFF
```

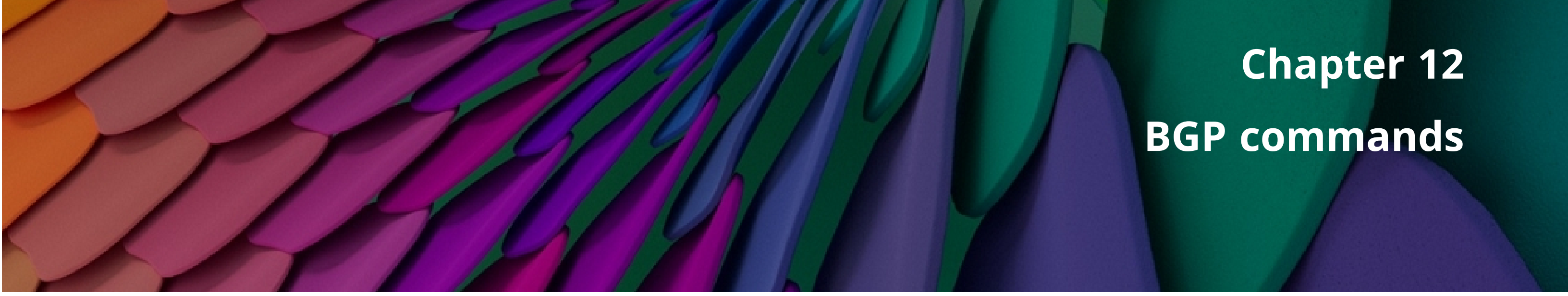
For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 12

BGP commands

address-family

```
address-family {{ipv4 | ipv6} unicast | l2vpn evpn}
no address-family {{ipv4 | ipv6} unicast | l2vpn evpn}
```

Description

Specifies address family to use and changes to the configuration context for the specified family:

- **config-bgp-ipv4-uc** for IPv4 unicast
- **config-bgp-ipv6-uc** for IPv6 unicast
- **config-bgp-l2vpn-evpn** for L2VPN EVPN

The **no** form of this command removes the specified address family configuration.

Parameter	Description
`ipv4`	Selects the IPv4 address family.
`ipv6`	Selects the IPv6 address family.
`unicast`	Specifies unicast addresses.
`l2vpn evpn`	Selects the L2VPN EVPN address family. Route maps with the **match vni** clause can be used with L2VPN EVPN neighbors only.

Example

Setting the address family to IPv4 unicast.

```
switch(config-bgp)# address-family ipv4 unicast
switch(config-bgp-ipv4-uc)#
```

Setting the address family to L2VPN EVPN.

```
switch(config-bgp)# address-family l2vpn evpn
switch(config-bgp-l2vpn-evpn)#
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

aggregate-address

```
aggregate-address <IP-ADDR>/<MASK> [as-set] [summary-only]
        [suppress-map <MAP-NAME>] [advertise-map <MAP-NAME>]
        [attribute-map <MAP-NAME>]

no aggregate-address <IP-ADDR>/<MASK> [as-set] [summary-only]
        [suppress-map <MAP-NAME>] [advertise-map <MAP-NAME>]
        [attribute-map <MAP-NAME>]
```

Description

Creates an aggregate address entry in the BGP routing table.

The **no** form of this command removes the specified aggregate address entry.

Parameter	Description
<ADDRESS>	Specifies an aggregate address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`as-set`	The AS_PATH attribute advertised for this route will contain an AS_SET consisting of all AS numbers contained in all paths that are being summarized.
`summary-only`	Creates the aggregate route but also suppresses advertisements of more-specific routes to all neighbors.
`suppress-map` *<MAP-NAME>*	Specifies an aggregate route for creation, but suppresses the advertisement of the created route. Match clauses of route maps can be used to suppress some more-specific routes of the aggregate selectively, and leave others unsuppressed. IP prefix lists and as_path lists match clauses are supported.
`advertise-map` *<MAP-NAME>*	Specifies routes that will be used to build attributes of the aggregate route, such as AS_SET or community.
`attribute-map` *<MAP-NAME>*	Specifies that the attributes of the aggregate route can be changed.

Examples

```
switch(config-bgp-ipv4-uc)# aggregate-address 10.0.0.0/8
switch(config-bgp-ipv4-uc)# no aggregate-address 10.0.0.0/8
```

```
switch(config-bgp-ipv6-uc)# aggregate-address 2001:0db8:85a3::8a2e:0370:7334/24
switch(config-bgp-ipv6-uc)# no aggregate-address 2001:0db8:85a3::8a2e:0370:7334/24
```

```
switch(config-bgp-ipv4-uc)# aggregate-address 10.0.0.0/8 as-set summary-only
switch(config-bgp-ipv4-uc)# aggregate-address 10.0.0.0/8 attribute-map RMap
```

```
switch(config-bgp-ipv6-uc)# aggregate-address 2001:0db8:85a3::8a2e:0370:7334/24
as-set summary-only
switch(config-bgp-ipv6-uc)# aggregate-address 2001:0db8:85a3::8a2e:0370:7334/24
attribute-map RMap
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

bgp always-compare-med

```
bgp always-compare-med
no bgp always-compare-med
```

Description

Enables comparison of the Multi Exit Discriminator (MED) for paths from neighbors in different autonomous systems. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command sets comparison of MED to the default setting (disabled).

Usage

- MED is one of the parameters that is considered when selecting the best path among many alternative paths. The path with a lower MED is preferred over a path with a higher MED.
- During the best-path selection process, MED comparison is done only among paths from the same autonomous system. Use the command `bgp always-compare-med` to change this behavior by

enforcing MED comparison between all paths, regardless of the autonomous system from which the paths are received.

Examples

```
switch(config-bgp)# bgp always-compare-med
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp always-compare-med
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp asnotation dotted

```
bgp asnotation dotted
no bgp asnotation dotted
```

Description

Specifies that Autonomous System (AS) numbers greater than 65535 be shown in dotted integer format for all show commands, including running-configuration.

The **no** form of this command restores the default format of non-dotted, simple integer.

Example

```
switch(config-bgp)# bgp asnotation dotted
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp asnotation dotted-plus

```
bgp asnotation dotted-plus
no bgp asnotation dotted-plus
```

Description

Specifies that all Autonomous System (AS) numbers be shown in dotted integer format for all show commands, including running-configuration.

The **no** form of this command restores the default format of non-dotted, simple integer.

Example

```
switch(config-bgp)# bgp asnotation dotted-plus
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp bestpath as-path ignore

```
bgp bestpath as-path ignore
no bgp bestpath as-path ignore
```

Description

Configures BGP to avoid considering the autonomous system (AS) path during best path route selection. By default, the AS-path is considered during BGP best path selection.

Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command restores default behavior which configures BGP to consider the AS-path during route selection.

Examples

```
switch(config-bgp)# bgp bestpath as-path ignore
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp bestpath as-path ignore
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp bestpath as-path multipath-relax

```
bgp bestpath as-path multipath-relax
no bgp bestpath as-path multipath-relax
```

Description

Configures Border Gateway Protocol (BGP) to treat two BGP routes as equal cost even if their AS-paths differ, as long as their AS-path lengths and other relevant attributes are the same. This allows routes with different AS-paths to be programmed into the forwarding table as equal cost multipath routes.

Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command restores the default behavior which configures BGP to treat two BGP routes as different costs when their AS-paths differ.

Examples

```
switch(config-bgp)# bgp bestpath as-path multipath-relax
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp bestpath as-path multipath-relax
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp bestpath compare-routerid

```
bgp bestpath compare-routerid
no bgp bestpath compare-routerid
```

Description

Configures a BGP routing process to compare identical routes received from different external peers during the best path selection process and selects the route with the lowest router ID as the best path. Defaults to disabled.

Any changes in BGP configuration are applied by restarting the current BGP sessions in the VRFs.

The **no** form of this command returns the BGP routing process to the default operation. By default, BGP selects the route that was received first when two routes with identical attributes are received.

Examples

```
switch(config-bgp)# bgp bestpath compare-routerid
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp bestpath compare-routerid
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp bestpath med confed

```
bgp bestpath med confed
no bgp bestpath med confed
```

Description

Compares the identical routes received from the different confederation peers and selects the route with the lowest Multi Exit Discriminator (MED) value as the best path. This behavior is disabled by default.

The **no** form of this command prevents the routing process from considering the MED value.

The selection of other attributes like `as-multi-path relax` and `as-path ignore` will not affect the behavior of this command within a confederation.

Examples

Selecting the route with lowest MED value:

```
switch(config-bgp)#  bgp bestpath med confed
All active BGP sessions in the VRF %s will be restarted.
Do you want to continue (y/n)?
```

Preventing the routing process from selecting the MED value:

```
switch(config-bgp)# no bgp bestpath med confed
All active BGP sessions in the VRF %s will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp bestpath med missing-as-worst

```
bgp bestpath med missing-as-worst
no bgp bestpath med missing-as-worst
```

Description

Configures a BGP routing process to assign a value of infinity (max possible) to routes that are missing the Multi Exit Discriminator (MED) attribute. The path without a MED value is the least desirable path. Any changes in BGP configuration are applied by restarting the current BGP sessions in the VRFs.

The **no** form of this command restores default behavior. The default behavior assigns a value of 0 to the missing MED.

Examples

```
switch(config-bgp)# bgp bestpath med missing-as-worst
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp bestpath med missing-as-worst
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp cluster id

```
bgp cluster-id {<IPV4-ADDR> | <ID>}
no bgp cluster-id {<IPV4-ADDR> | <ID>}
```

Description

Specifies the cluster ID when the BGP router is used as a route-reflector. The cluster ID default is the router ID. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command sets the cluster ID to the default value, which is the router ID.

Parameter	Description
<IPV4-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address **192.169.005.100** becomes **192.168.5.100**.
<ID>	Specifies the cluster ID as 32-bit number. Range: 1 to 4294967295.

Examples

```
switch(config-bgp)# bgp cluster-id 2.2.2.2
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp cluster-id 2.2.2.2
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp confederation

```
 bgp confederation <AS-NUMBER>
no bgp confederation<AS-NUMBER>
```

Description

Configures a BGP confederation with the confederation identifier. The group of Autonomous Systems (ASs) will be presented as a single autonomous system with the confederation identifier as the AS number.

The **no** form of the command deletes the BGP confederation identifier.

Parameter	Description
<AS-NUMBER>	Sets the identifier for the confederation. Range:1-4294967295.

Examples

Configuring the BGP confederation with the AS number:

```
switch(config-bgp)# bgp confederation 100
```

Deleting BGP confederation identifier:

```
switch(config-bgp)# no bgp confederation 100
This will delete BGP confederation identifier on this device.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp confederation peers

```
bgp confederation peers <AS NUMBER>
no bgp bgp confederation peers <AS NUMBER>
```

Description

Configures BGP confederation peers with both same and different sub-autonomous system to establish an eBGP membership. You can configure a list of AS numbers separated by spaces.

The **no** form of this command disables the peer session and deletes the peer information.

Parameter	Description
<AS NUMBER>	Specifies the autonomous system numbers to establish an eBGP membership. Range: 64512-65535.

Examples

```
switch(config-bgp)# bgp confederation peers 64512 64513
```

```
switch(config-bgp)# no bgp confederation peers 64512
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp dampening

```
bgp dampening {{half-life <HALF-TIME> reuse <LOW-THRESHOLD> suppress <HI-THRESHOLD> max-
suppress-time <MAX-TIME>}
| route-map <NAME>}
```

Description

Enables route flap dampening which reduces the propagation of unstable routes in the network.

Parameter	Description
`half-life <HALF-TIME>`	Specifies the half-life time in minutes. When the time expires, the penalty on a route gets reduced exponentially to half its current value. Default: 15.
`reuse <LOW-THRESHOLD>`	Specifies the lower threshold of penalty. On a suppressed route, when the penalty on a route falls below this value, the route is unsuppressed. Default: 750.
`suppress <HI-THRESHOLD>`	Specifies the upper threshold of penalty. When the penalty on a flapping route exceeds this value, the route is suppressed. Default: 2000.
`max-suppress-time <MAX-TIME>`	Specifies the maximum time to keep a route suppressed in minutes. Once this timer expires, the route is unsuppressed. Default: 60.
`route-map <NAME>`	Specifies the name of a route map.

These parameters can be configured at the router level for specific address families or the same parameters can be configured under a route map which can be applied to dampening command.

Usage

The dampening algorithm assigns a penalty of 1000 to a flapping route every time the route gets withdrawn. The penalty values accumulate on the route every time it flaps. However, the penalty decays and is reduced to half its value by the half-life time.

This feature is not applicable on IBGP routes.

Example

```
switch(config)# router bgp 1
switch(config-bgp)# address-family ipv4 unicast
switch(config-bgp-ipv4-uc)# bgp dampening

switch(config-bgp-ipv4-uc)# bgp dampening route-map abc

switch(config-bgp-ipv4-uc)# bgp dampening route-map xyz

switch(config-bgp-ipv4-uc)# bgp dampening half-life 10 reuse 100 suppress 250 max-
suppress-time 45
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc`	Administrators or local user group members with execution rights for this command.

bgp default local-preference

```
bgp default local-preference <NUMBER>
no bgp default local-preference
```

Description

Default local preference value for BGP learned routes. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command sets the local preference to the default value of 100.

Parameter	Description
<NUMBER>	Specifies the local preference value. Range: 0 to 4294967295. Default: 100.

Examples

```
switch(config-bgp)# bgp default local-preference 20
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp default local-preference
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp deterministic-med

```
bgp deterministic-med
no bgp deterministic-med
```

Description

Enables comparison of the Multi-Exit Discriminator (MED) attribute when selecting routes advertised by different peers in the same autonomous system. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command sets MED comparison to the default setting of disabled.

Examples

```
switch(config-bgp)# bgp deterministric-med
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp deterministic-med
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp fast-external-fallover

```
bgp fast-external-fallover
no bgp fast-external-fallover
```

Description

Sets the switch to reset the BGP sessions of any directly adjacent external peers when the connected link goes down. It is enabled by default.

The **no** form of this command restores the default behavior where BGP waits until the hold time expires before closing sessions.

Examples

```
switch(config-bgp)# bgp fast-external-fallover
switch(config-bgp)# no bgp fast-external-fallover
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.08	The default behavior has been changed from disabled to enabled state. **NOTE:** When upgrading, the feature will remain in the state it was (disabled or

Release	Modification
	enabled) in the earlier release.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp graceful-restart restart-time

```
bgp graceful-restart restart-time <DELAY>
no bgp graceful-restart restart-time
```

Description

Sets the graceful restart timer which determines how long the switch waits for a graceful-restart capable neighbor to re-establish BGP peering. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command resets to the default value of 120 seconds.

Parameter	Description
<DELAY>	Graceful restart timer delay in seconds. Range: 1 to 3600. Default: 1500.

Usage

- Graceful restart functionality is enabled by default, and there is no command to disable the functionality at the protocol level.
- However, the graceful-restart functionality can be disabled globally using the command **router graceful-restart**.

Examples

```
switch(config-bgp)# bgp graceful-restart restart-time 150
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp graceful-restart restart-time
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp graceful-restart stalepath-time

```
bgp graceful-restart stalepath-time <TIME>
no bgp graceful-restart stalepath-time
```

Description

Sets the stale path timer. This timer determines how long BGP keeps stale routes from the restarting BGP peer. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command resets to the stale path timer to the default of 300 seconds.

Parameter	Description
<TIME>	Specifies the stale path timer in seconds. Range: 1 to 3600. Default: 300.

Examples

```
switch(config-bgp)# bgp graceful-restart stalepath-time 300
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp graceful-restart stalepath-time
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp log-neighbor-changes

```
bgp log-neighbor-changes
no bgp log-neighbor-changes
```

Description

Enables logging of BGP neighbor session state changes.

The **no** form of this command disables logging of changes in BGP neighbor adjacencies.

Examples

```
switch(config-bgp)# bgp log-neighbor-changes
switch(config-bgp)# no bgp log-neighbor-changes
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp maxas-limit

```
bgp maxas-limit <LENGTH>
no bgp maxas-limit
```

Description

Specifies the maximum size of AS paths in update messages. Routes with AS paths greater than the specified length are discarded.

The **no** form of this command sets the limit to the default of 32.

Parameter	Description
<LENGTH>	Specifies the number of AS segments. Length: 1 to 32 characters. Default: 32.

Example

```
switch(config-bgp)# bgp maxas-limit 20
switch(config-bgp)# no bgp maxas-limit
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp router-id

```
bgp router-id <ROUTER-ID>
no bgp router-id <ROUTER-ID>
```

Description

Configures a fixed router ID for the BGP peer process running on the router. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

The **no** form of this command removes the fixed router ID from the running configuration and restores the default router ID selection.

Parameter	Description
<ROUTER-ID>	If router-id is changed, then all the active BGP peer sessions go down and restart with the newly configured router-id.

Usage

BGP determines the router ID as follows:

1. The address configured with the command `bgp router-id`.
2. The highest IP address on all the loopback interfaces.
3. The highest IP address on any interface.

Examples

```
switch(config-bgp)# bgp router-id 1.1.1.1
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

```
switch(config-bgp)# no bgp router-id 1.1.1.1
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

bgp update-group

```
bgp update-group
no bgp update-group
```

Description

Enables the update-group feature. Update-group is used to optimize BGP processing. With update-group enabled, neighbors that share same outbound policy are grouped under single update-group and update messages are shared to all peers within that group. Disabled by default.

On enabling/disabling update-group, all the current BGP sessions including dynamic peer sessions will be restarted. The dynamic peer sessions will get re-established based on the connect-retry timer configured on the peer device.

BGP determines the AS number size to be used with each individual peer based on the configured AS octet-size on the peers. If BGP is configured to use 2 octet ASN with peer A and 4 octet ASN with peer B, then BGP updates sends to peer A and peer B will be different. Therefore, they will form into two different update-groups.

This feature is supported for IBGP alone. It is not recommended to enable update-group on VPNv4 address families or configure update-group if an VPNv4 address family is configured. Update-group indices are created automatically and cannot be configured. Indices are ephemeral in nature. Update-group indices will not be retained across process restart. When update-group is configured, route reflector clients and non route reflector clients are parted into different update-groups. The use of update-groups imposes the following limitations in BGP processing:

1. While advertising routes to peers of the update-group, the check on route's next-hop is ignored. This means that, BGP routes can get advertised to a peer even if the next-hop IP of the routes is same as peer's IP, and the peer should discard such routes.
2. The use of ORF is restricted. BGP will continue to send outbound route filters to peers, but received filters are ignored.
3. Sender loop detection is delayed until the point where UPDATE messages are sent to the members of the update-group. This means route dropped by the sender due to loop detection will still count as advertised, as they have been advertised to the update-groups.

It is recommended to enable BGP update-group globally before configuring BGP neighbors. This ensures that toggling of BGP neighborship can be avoided and memory of the routing process can be optimized.

The **no** form of this command disables the update-group feature.

Examples

Enabling BGP update-group:

```
switch(config-bgp)# bgp update-group
All current BGP sessions in VRF default will be restarted.
 Do you want to continue (y/n)?
```

Disabling BGP update-group:

```
switch(config-bgp)# no bgp update-group
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

clear bgp

```
clear bgp [vrf <VRF-NAME>][ipv4 unicast | ipv6 unicast | all]
     {* | <NEIGHBOR-IP-ADDR>} [soft in]
```

Description

Resets BGP peer sessions. Sends a route refresh request when you have specified **soft in**. Optionally, you can specify reset for a specific VRF.

Parameter	Description
`ipv4 unicast`	Specifies the IPv4 address family.
`ipv6 unicast`	Specifies the IPv6 address family.
`l2vpn evpn`	Selects the L2VPN EVPN address family
`vrf` *`<VRF-NAME>`*	Specifies a VRF name.
`all`	Specifies all VRFs and address families.
`* |` *`<NEIGHBOR-IP-ADDRESS>`*	Specifies a neighbor IP address for which peer sessions are to be reset, or `*` to reset all sessions.
`soft in`	Send a route refresh request.

Examples

```
add descriptions for all examples
switch# clear bgp all *
switch# clear bgp ipv4 unicast 192.168.12.1 soft in
```

```
switch# clear bgp l2vpn evpn * soft in
switch# clear bgp l2vpn evpn 9.0.0.2 soft in
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

disable|enable

`disable | enable`

Description

This command disables or enables the BGP instance while retaining the configuration. Disable and enable of the BGP instance may result in a change of the router ID.

By default the BGP instance is enabled.

Examples

```
switch(config)# router bgp 100
switch(config-bgp)# disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

distance bgp

```
distance bgp <EXTERNAL> <INTERNAL>
no distance bgp <EXTERNAL> <INTERNAL>
```

Description

Configures the administrative distance for BGP.

The **no** form of this command restores the default settings, 20 for eBGP and 200 for iBGP,

Parameter	Description
<EXTERNAL>	Specifies the administrative distance for eBGP routes. Range: 1 to 255. Default: 20.
<INTERNAL>	Specifies the administrative distance for iBGP routes. Range: 1 to 255. Default: 200.

Example

```
switch(config-bgp-ipv4-uc)# distance bgp 100 150
switch(config-bgp-ipv4-uc)# no distance bgp 100 150
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

maximum-paths

```
maximum-paths <MAXPATHS>
no maximum-paths <MAXPATHS>
```

Description

Configures the maximum number of paths that BGP adds to the route table for equal-cost multipath (ECMP) load balancing for routes learned from both internal and external BGP. Any changes in BGP configuration are applied by restarting the current BGP sessions on the VRFs.

On 8325 and 10000 switch series, a maximum-paths configuration is supported globally as well as for **ipv4-unicast**, **ipv6-unicast** and **l2vpn-evpn** address families. For 6300, 6400, 8100, 8360, 8320, 8400 and 9300 switch series, this configuration is supported globally and for **l2vpn2-evpn address** families.

If address-family specific maximum-paths are configured, they take precedence over global configuration. Greater than eight maximum-paths at can be configured within the global context, but for **l2vpn-evpn** routes the supported maximum limit is still eight.

The **no** form of this command restores the default setting of 4.

Parameter	Description
<MAXPATHS>	Specifies the maximum number of paths. 1 to 32 paths can be set globally. 1 to 8 paths can be set for an individual address family. The default is 4.

Usage

When both global and address-family maximum paths are configured then the address family value takes precedence.

Global max-path	l2evpn, ipv4-unicast,or ipv6-unicast address-family Max-path	Operational Max-path	Comments
Default(4)	Default (4)	4	--
Configured (4)	configured (4)	4	Four is the configured value for address family paths
Default (4)	8 (max)	8	The address family value takes

Global max-path	l2evpn, ipv4-unicast,or ipv6-unicast address-family Max-path	Operational Max-path	Comments
			precedence
32 (max)	8 (max)	8	CLI configuration is limited to eight paths.
Default (8)	configured (4)	4	Four is the configured value for address family paths

Examples

Configuring the maximum number of global paths:

```
switch(config)# router bgp 1
switch(config-bgp)# maximum-paths 32
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)? y
```

Configuring the maximum-paths for the l2vpn-evpn address family:

```
switch(config-bgp)# address-family l2vpn evpn
switch(config-bgp-l2vpn-evpn)# maximum-paths 6
```

Removing the global maximum paths setting:

```
switch(config-bgp)# no maximum-paths
All current BGP sessions in VRF default will be restarted.
Do you want to continue (y/n)? y
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.13.1000	On 8325 and 10000 switch series configuration is supported on **ipv4-unicast**, **ipv6-unicast** and **l2vpn-evpn** address families. For 6300, 6400, 8100, 8360, 8320, 8400 and 9300 switch series, this configuration is supported globally and for **l2vpn2-evpn address** families.
10.10	Increased upper limit of range of <*MAXPATHS*> parameter to 32.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp` `config-bgp-l2vpn-evpn`	Administrators or local user group members with execution rights for this command.

neighbor activate

```
neighbor <IP-ADDR> activate
no neighbor <IP-ADDR> activate
```

Description

This command enables the address-family capability and exchange of information specific to an address family with a BGP neighbor.

The **no** form of this command removes the address-family capability and disables the exchange of routes for the specified address-family with the BGP neighbor.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 activate
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 activate
```

```
switch(config-bgp-l2vpn-evpn)# neighbor 1.1.1.1 activate
switch(config-bgp-l2vpn-evpn)# no neighbor 1.1.1.1 activate
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-bgp-ipv4-uc`
	`config-bgp-ipv6-uc`
	`config-bgp-l2vpn-evpn`
		Administrators or local user group members with execution rights for this command.

neighbor advertisement-interval

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} advertisement-interval <INTERVAL>
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} advertisement-interval
```

Description

Sets the advertisement interval, which defines the length of time between transmission of BGP routing updates.

The **no** form of this command restores the default value. Default values are 30 seconds for external BGP peer and 5 seconds for internal BGP peer.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<PEER-GROUP-NAME>	Specifies a Peer-Group.
<INTERVAL>	Specifies the advertisement interval in seconds. Range: 0 to 600. Default: 30 for external BGP peer and 5 for internal BGP peer.

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 advertisement-interval 20
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 advertisement-interval
```

```
switch(config-bgp-ipv4-uc)# neighbor pg advertisement-interval 50
switch(config-bgp-ipv4-uc)# no neighbor pg advertisement-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor add-paths

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} add-paths {send | recv | both}
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} add-paths {send | recv | both}
```

Description

Enables additional path capability for BGP as described in RFC 7911. This allows BGP peer to send, receive, or send and receive multiple paths for the same address prefix without the subsequent advertisements implicitly replacing any previous paths. The additional path includes the first (N-1) best paths, which means that the total paths for an address prefix received by a BGP speaker will include the best path and the additional paths determined by its BGP peer.

With additional path feature, each path is identified by a path identifier in addition to the address prefix. To use this command, the backup path of BGP next-hop must be different than the primary path.

The **no** form of this command disables the additional path feature.

Parameter	Description
<IP-ADDR>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
`add-paths {send | recv | both}`	Configures the additional paths in one of the following ways: `send`—Enables the neighbor to send the additional paths. `recv`—Enables the neighbor to receive the additional paths. `both`—Enables the neighbor to send and receive the additional paths.

Examples

Enabling BGP neighbor to send the additional paths:

```
switch(config)# router bgp 100
switch(config-bgp)# address-family ipv4 unicast
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 add-paths send
```

Disabling BGP neighbor to send the additional paths:

```
switch(config)# router bgp 100
switch(config-bgp)# address-family ipv4 unicast
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 add-paths send
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor add-paths advertise-best

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} add-paths advertise-best <2-4>
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} add-paths advertise-best <2-4>
```

Description

Controls the number of best BGP Paths to be advertised by a BGP speaker to a BGP peer. When enabled, it allows BGP speaker to advertise more than one best paths for the same address prefix. The total paths for an address prefix will include the best path and the additional paths.

The **no** form of this command removes the advertise best path configuration.

Parameter	Description
<IP-ADDR>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
`advertise-best` *<2-4>*	Specifies the number of best BGP paths to be advertised to a BGP Peer. Range: 2 to 4. Default: 2.

Examples

Setting the number of best paths to send to the neighbor:

```
switch(config)# router bgp 100
switch(config-bgp)# address-family ipv4 unicast
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 add-paths advertise-best 3
```

Removing the advertise best path configuration:

```
switch(config)# router bgp 100
switch(config-bgp)# address-family ipv4 unicast
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 add-paths advertise-best 3
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor allowas-in

```
neighbor {<IP-ADDRESS> |<LIMIT>
no neighbor {<IP-ADDRESS> |<LIMIT>
```

Description

Specifies the number of times that the AS path of a received route can contain the AS number of the recipient BGP speaker and still be accepted. When this configuration is applied to a peer-group, all the neighbors that are part of the peer-group inherit this setting.

The **no** form of this command restores the default setting, which is to reject as a loop any route where the path contains the speaker AS number.

Parameter	Description
<IP-ADDRESS>	Specifies the neighbor IP address in the IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or in the IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. **NOTE:** IPv6 MP-BGP peering must not be used for L2VPN EVPN address family, because VXLAN tunnel interface does not support IPv6 addresses.
<PEER-GROUP-NAME>	Specifies a peer group.
<LIMIT>	Specifies the number of times that the AS path of a received route can contain the AS number of the recipient BGP. Range: 1 to 10.

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 allowas-in 5
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 allowas-in
```

```
switch(config-bgp-ipv6-uc)# neighbor 2001:0db8:85a3::8a2e:0370:7334 allowas-in 5
switch(config-bgp-ipv6-uc)# no neighbor 2001:0db8:85a3::8a2e:0370:7334 allowas-in
```

```
switch(config-bgp-ipv4-uc)# neighbor PG allowas-in 5
switch(config-bgp-ipv4-uc)# no neighbor PG allowas-in
```

```
switch(config-bgp-l2vpn-evpn)# neighbor 1.1.1.1 allowas-in 5
switch(config-bgp-l2vpn-evpn)# no neighbor 1.1.1.1 allowas-in
```

```
switch(config-bgp-l2vpn-evpn)# neighbor PG allowas-in 5
switch(config-bgp-l2vpn-evpn)# no neighbor PG allowas-in
```

```
switch(config-bgp-l2vpn-evpn)# neighbor 2001:0db8:85a3::8a2e:0370:7334 allowas-in
5
switch(config-bgp-l2vpn-evpn)# no neighbor 2001:0db8:85a3::8a2e:0370:7334 allowas-
in
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-bgp-ipv4-uc`
	`config-bgp-ipv6-uc`
	`config-bgp-l2vpn-evpn`
		Administrators or local user group members with execution rights for this command.

neighbor ao

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} ao <keychain-name>
   accept-ao-mismatch
   include-tcp-options
   no ...
```

Description

Enables TCP Authentication Option (TCP-AO) authentication on a TCP connection between two BGP neighbors. To disable this function, use the **no** form of this command.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
`<keychain-name>`	Name of the keychain for the neighbor. The keychain allows keys to be configured with different valid lifetimes. This mechanism provides a way for a set of keys to be rotated and hence protect against long-lived-key attacks. At any given time only one key is selected as active-key and keys are valid for a duration of the defined send-lifetime. If the send-lifetime and the accept-lifetimes are not configured for the key, the key is considered to be valid for infinite lifetime. When multiple keys are configured, its recommended that keys overlap in their send-lifetimes so that the key rollover occurs at the start of the next key's send-lifetime. This allows for a continuous key usage by TCP-AO.
`accept-ao-mismatch`	Accept incoming TCP segments without TCP-AO option. If enabled, the device will accept a connection from the peer *even if the received TCP packets do not contain the TCP-AO option*.
`include-tcp-options`	Include the TCP header options for MAC calculation. Note that enabling this setting will immediately reset the neighbor session.

Parameter	Description
	This setting is disabled by default.
`no ...`	Negates any configured parameter.

Usage

TCP-AO authentication can not be used with the neighbor password feature. When TCP-AO is applied to a peer-group, all the neighbors in peer-group will inherit the peer-group configuration unless there is a configuration specific to an individual neighbor. If a peer-group is configured with the neighbor password feature but the neighbors that belong to that peer-group are configured with TCP-AO, the TCP-AO configuration will be rejected. Similarly, If a peer-group is configured to use TCP-AO authentication, the neighbors that belong to that peer-group will reject the neighbor password.

The neighbor connection must be reset using the **clear ip bgp** command for the TCP-AO configuration to take effect.

The TCP-AO feature takes a keychain as a parameter. The key will not be valid until a Recv-D, Send-ID, and send lifetime is configured. The supported cryptographic algorithms for TCP-AO are:

- HMAC-SHA-1-96 based on [RFC2104] and [FIPS-180-3]
- AES-128-CMAC-96 based on [NIST-SP800-38B][FIPS197]

Examples

```
switch(config)# keychain bgpkeys
switch(config-keychain)# key 1
switch(config-keychain-key)# send-lifetime start-time 10:10:10 10/25/2022 duration
infinite
switch(config-keychain-key)# accept-lifetime start-time 10:10:10 10/25/2022
duration infinite
switch(config-keychain-key)# send-id 10
switch(config-keychain-key)# recv-id 10
switch(config-keychain-key)# cryptographic-algorithm aes-cmac-128
switch(config-keychain-key)# key-string plaintext qwer
switch(config)# router bgp 1
switch(config-bgp)# neighbor 1.1.1.1 ao bgpkeys
switch(config-bgp)# no neighbor 1.1.1.1 ao accept-ao-mismatch
switch(config-bgp)# no neighbor 1.1.1.1 ao include-tcp-option
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.11 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor capability orf prefix-list

```
neighbor <IP-ADDRESS> capability orf prefix-list {send | receive | both}
no neighbor <IP-ADDRESS> capability orf prefix-list {send | receive | both}
```

Description

Enables the Outbound Route filtering (ORF) capability with the neighbor in one of the three available modes. The available modes are send, receive, and both. The ORF capability is executed based on prefix list only.

The Outbound Route Filtering (ORF) capability provides a mechanism for a BGP speaker to send a set of Outbound Route Filters (ORFs) that can be used by its BGP peer to filter its outbound routing updates to the speaker. This is a filtering method used to reduce the computation on the router receiving the route.

The **no** form of this command disables the ORF capability.

Parameter	Description
`<IP-ADDRESS>`	Specifies an IP address.
`capability orf prefix-list {send | receive | both}`	Enables ORF prefix list capability with the neighbor in one of the following modes: ■ **send** - Enables the ORF prefix list capability in send mode. ■ **receive** - Enables the ORF prefix list capability in receive mode. ■ **both**- Enables the ORF prefix list capability in both send and receive mode.

Examples

Enabling the ORF prefix list capability in both send and receive mode:

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 capability orf prefix-list both
```

Enabling the ORF prefix list capability in send mode:

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 capability orf prefix-list send
```

Disabling the ORF prefix list capability in both send and receive mode: :

```
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 capability orf prefix-list both
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor default-originate

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} default-originate [route-map <MAP-NAME>]
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} default-originate [route-map <MAP-NAME>]
```

Description

Enables the local router to send the default route 0.0.0.0 to a neighbor. The neighbor can then use this route to reach the router when all other routes are unavailable. Use the `route-map` option to configure the route map to modify the default route attributes.

The **no** form of this command disables this feature.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<PEER-GROUP-NAME>	Specifies a peer group.
<MAP-NAME>	Sets the route map to modify the default route attributes.

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 default-orginate
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 default-originate
```

```
switch(config-bgp-ipv4-uc)# neighbor PG default-originate
switch(config-bgp-ipv4-uc)# no neighbor PG default-originate
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor ebgp-multihop

```
neighbor {<IP-ADDR> | <PEER-GROUP-NAME>} ebgp-multihop <HOP-COUNT>
no neighbor {<IP-ADDRESS> |<HOP-COUNT>
```

Description

Enables BGP to establish a session with external peers residing on networks that are not directly connected. By default, BGP can only establish sessions with external BGP peers that are directly connected.

The neighbor connection must be reset using `clear bgp` to allow this configuration to take effect.

The **no** form of this command disables the peer ebgp-multihop feature.

Parameter	Description
<IP-ADDR>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
`ebgp-multihop` *<HOP-COUNT>*	Specifies the maximum number of hops to reach the peer.

Examples

Enabling BGP to establish connection with external peers residing on networks that are not directly connected:

```
switch(config-bgp)# neighbor 1.1.1.1 ebgp-multihop 5
switch(config-bgp)# no neighbor 1.1.1.1 ebgp-multihop
```

Disabling BGP to establish connection with external peers residing on networks that are not directly connected:

```
switch(config-bgp)# neighbor pg ebgp-multihop 5
switch(config-bgp)# no neighbor pg ebgp-multihop
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor fall-over

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} fall-over
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} fall-over
```

Description

Enables BGP fast peering session deactivation. When neighbor fall-over is configured, the BGP process monitors the RIB and if the route to peer is not present in the routing table, it immediately deactivates the peer session without waiting for the hold down timer. It is disabled by default.

The **no** form of this command disables this feature.

Parameter	Description
<IP-ADDR>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.

Usage

Neighbor fall-over does not track connected or static routes to peers. However, this is not an issue when IBGP peering is using a loopback interface. To force a fall-over for connected and static routes, use the command `neighbor fall-over bfd`.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 fall-over
switch(config-bgp)# no neighbor 1.1.1.1 fall-over
```

```
switch(config-bgp)# neighbor PG fall-over
switch(config-bgp)# no neighbor PG fall-over
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor fall-over bfd

```
neighbor {<IPV4-ADDR>|<IPV6-ADDR>|<PEER-GROUP-NAME>} fall-over bfd
no neighbor {<IPV4-ADDR>|<IPV6-ADDR>|<PEER-GROUP-NAME>} fall-over bfd
```

Description

Enables BGP to register with BFD to receive fast peering session deactivation messages from BFD. You can either configure BFD support for BGP per neighbor or peer-group.

The **no** form of this command disables BGP for BFD.

Multihop BFD is not supported for BGP.

Parameter	Description
<IPV4-ADDR>	Specifies the neighbor address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<IPV6-ADDR>	Specifies the neighbor address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. This parameter applies only to 6300 and 6400 switch series.
<PEER-GROUP-NAME>	Specifies a peer group.

Examples

Enabling BFD for BGP neighbor with IPv4 address:

```
switch(config-bgp)# neighbor 1.1.1.1 fall-over bfd
```

Enabling BFD for BGP neighbor with IPv6 address (applies only to 6300 and 6400 switch series):

```
switch(config-bgp)# neighbor 1000::1 fall-over bfd
```

Enabling BFD for peer group:

```
switch(config-bgp)# neighbor PG fall-over bfd
```

Disabling BFD for BGP per neighbor IPv4 address:

```
switch(config-bgp)# neighbor 1.1.1.1 fall-over bfd
```

Disabling BFD for BGP per neighbor with IPv6 address (applies only to 6300 and 6400 switch series):

```
switch(config-bgp)# no neighbor 1000::1 fall-over bfd
```

Disabling BFD for peer group:

```
switch(config-bgp)# no neighbor PG fall-over bfd
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor graceful-shutdown

```
neighbor {<IP-ADDR> | <PEER-GROUP-NAME>} graceful-shutdown
     [ local-preference <LOCAL-PREF>
     | <CONFIG-DELAY>
     |<LOCAL-PREF> ]

no neighbor {<IP-ADDR> | <PEER-GROUP-NAME>} graceful-shutdown
     [ local-preference <LOCAL-PREF>
     | <CONFIG-DELAY>
     |<LOCAL-PREF> ]
```

Description

Configures the wait time before shutting down the BGP neighbor session, and can also configure the local preference value to be advertised before graceful shutdown.

The **no** form of this command sets the wait time to the default value of 180 seconds and the local-preference value to the default of 0.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<PEER-GROUP-NAME>	Specifies a peer group.
local-preference*<LOCAL-PREF>*	Specifies the local preference value for exporting the iBGP routes

Parameter	Description
	during a graceful shutdown. The lower the value, the lower the local preference. A value of 0 indicates that the route is the least preferred. Range: 0 to 4294967295. Default: 0.
<CONFIG-DELAY>	Specifies the time to wait before shutting down the neighbor in seconds. Range: 10 to 1200. Default: 180.

Usage

If the graceful shutdown timer has already started and the administrator configures a command that triggers a session restart, traffic loss can occur if the graceful shutdown delay is not sufficient for the BGP peers to converge to a new route.

On each Autonomous System Boundary Router (ASBR) supporting the graceful shutdown receiver procedure, an inbound BGP route policy must be applied on all EBGP sessions of the ASBR.

The policy must match the GSHUT community and lower the precedence of the route by changing the route attributes.

The Graceful-Shutdown feature does not work for reflected routes because the route reflector (RR) does not modify local-preference attribute. The routes, originated by the RR, carry the GSHUT local-preference value. As per the RFC 4456, when an RR reflects a route, it should not modify the following path attributes:

- NEXT-HOP
- AS-PATH
- LOCAL-PREF
- MED

Their modification could potentially result in routing loops. In this situation, apply on the RR an inbound BGP route policy, meeting the following conditions:

- Match the graceful-shutdown community.
- Set the local preference attributes of the paths tagged with the graceful-shutdown community to a lower value than other routes to the same destination.

Examples

Setting the wait time delay:

```
switch(config-bgp)# neighbor 1.1.1.1 graceful-shutdown 10
```

Setting the local-preference value:

```
switch(config-bgp)# neighbor 1.1.1.1 graceful-shutdown local-preference 100
```

Setting the wait time delay and local-preference value:

```
switch(config-bgp)# neighbor 1.1.1.1 graceful-shutdown 10 local-preference 100
```

Setting the wait time delay to the default of 180 seconds:

```
switch(config-bgp)# no neighbor 1.1.1.1 graceful-shutdown 10
```

Setting the local-preference value to default of 0:

```
switch(config-bgp)# no neighbor 1.1.1.1 graceful-shutdown local-preference 100
```

Setting the wait time delay and local-preference value to defaults:

```
switch(config-bgp)# no neighbor 1.1.1.1 graceful-shutdown 10 local-preference 100
```

Complete deletion:

```
switch(config-bgp)# no neighbor 1.1.1.1 graceful-shutdown
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor listen ip-range

```
neighbor <PEER-GROUP-NAME> listen ip-range <IP-ADDR>/<MASK> {as-range <AS-RANGE> | limit
<LIMIT>}
no neighbor <PEER-GROUP-NAME> listen ip-range <IP-ADDR>/<MASK> {as-range <AS-RANGE> |
limit <LIMIT>}
```

Description

Configures BGP dynamic neighbors as ranges of remote addresses with associated peer groups.

The **no** form of this command restores default behavior.

- Each range of remote addresses is configured as a remote address prefix.
- Any BGP peer with a remote address that matches the remote address prefix becomes a member of the associated peer group.

Parameter	Description
<PEER-GROUP-NAME>	Specifies peer group.
<IP-ADDR>/*<MASK>*	Specifies subnet range.
<AS-RANGE>	Specifies AS number as a range in integer or dotted format.
<LIMIT>	Specifies maximum number of peers. Range: 1 to 256.

Restrictions

- Dynamic peers are always passive. Outbound connections to dynamic peers are not supported.
- Dynamic BGP peering is only compatible with peer-groups
- Disabling partial AS range is not supported. The exact value that is configured must be used.
  - When disabling AS range, CLI must use the same AS range that was used when first configured. For example, if AS range "1-4" is configured, when disabling, "1-4" must be used ("1,2,3,4" is not supported).

Configuring overlapping peer ranges with different remote address prefix lengths is not recommended. Peer range configuration is recommended when peer ranges do not overlap.

Usage

- All supported address-families are activated on a dynamic peer for negotiation by default.
- If an incoming connection matches multiple peer range entries, the entry with the longest remote address prefix is selected.
- AS ranges are used to match remote AS presented by connecting peers. Remote AS matching with ASes or AS ranges in this list will be accepted.
  - AS range only applies to dynamic peers.
- The limit option is used to set the maximum number of dynamic BGP peers within the peer range. The default is 512 if no limit is set.
  - If the limit is reached, BGP rejects incoming connections from new dynamic BGP peers until BGP session termination causes the number of dynamic BGP peers to fall below the limit.
  - If the limit is reduced below the current number of dynamic BGP peers, BGP will reject incoming connections from new dynamic BGP peers until the number of dynamic BGP peers falls below the new limit. BGP will not terminate existing BGP sessions with dynamic BGP peers in this case. If an existing BGP session gets terminated, that session will not re-establish until the number of BGP sessions falls below the limit.
- After dynamic peer is configured, additional configuration is required on the peer-group as a whole. Individual member groups are incompatible. For example, the neighbor shutdown command can be executed on a peer-group, but not on individual members of the peer-group.
- When a peer is configured as dynamic and is in an established state, a shutdown is required before reconfiguring as static.
- Connect-retry interval is recommended to be configured with a smaller value than the default value on the active peer.

- When a set of valid and invalid AS values are issued (separated by commas), only the valid values are accepted.
- When the AS range parameter is not explicitly configured in dynamic bgp peering, iBGP session comes up, eBGP session does not. If there are no configured remote AS or AS list entries, DC-BGP assumes that any peer is an iBGP peer.

Examples

```
switch(config-bgp)# neighbor pg listen ip-range 192.168.0.0/16
```

```
switch(config-bgp)# no neighbor pg listen ip-range 192.168.0.0/16
```

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor local-as

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} local-as <AS-NUMBER>
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} local-as
```

Description

Configures an alternate local AS number that can be used to establish a session with a peer, allowing a router to appear to be a member of a second autonomous system (AS), and its real AS.

Local AS allows two autonomous systems to merge without modifying peering arrangements. This command is valid only for external peers.

The **no** form of this command restores the default, which is for a peering session to be established using the primary AS (primary AS is the AS number specified at the time of neighbor creation using the command `neighbor remote-as`).

Parameter	Description
<IP-ADDR>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
`local-as` *<AS-NUMBER>*	Specifies a 4-byte AS number in asplain format (z), or asdot format (x.y), where z is a number from 1 to 4294967295 and x and y are 16-bit numbers.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 local-as 200
switch(config-bgp)# no neighbor 1.1.1.1 local-as
```

```
switch(config-bgp)# neighbor pg local-as 200
switch(config-bgp)# no neighbor pg local-as
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor maximum-prefix

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>}
        maximum-prefix <MAXIMUM> [threshold <THRESHOLD>]
        [restart <INTERVAL>] [warning-only]
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} maximum-prefix
```

Description

Sets the maximum number of prefixes that can be received from a neighbor.

By default, the device accepts 128,000 prefixes from a BGP neighbor with a threshold value of 75%. A warning message is generated when the number of prefixes per neighbor reaches 75% of default prefix limit. Another warning message is generated when the default prefix limit is reached.

The session is re-established only if the number of routes received from the BGP peer does not exceed the configured prefix limit. When the restart timer is configured, sessions are automatically re-established when the timer expires.

The **no** form of this command disables the maximum number of prefixes limit.

Parameter	Description
<IP-ADDRESS>	Specifies the IP address of the neighbor in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<PEER-GROUP-NAME>	Specifies a Peer-Group.
maximum-prefix *<MAXIMUM>*	Specifies the maximum number of prefixes allowed from the

Parameter	Description
	specified neighbor. Range: 1 to 128000. Default: 128000.
`threshold <THRESHOLD>`	Specifies at what percentage of `MAXIMUM` a warning message is generated. Range: 1 to 100. Default: 75. For example, if `MAXIMUM` is set to 1000 and threshold is 70, the router generates a warning message when the number of BGP learned routes from the neighbor exceeds 70 percent of 1000 (700) routes.
`restart <INTERVAL>`	Specifies interval in seconds for restarting the BGP connection when the prefix limit is exceeded. Range: 30 to 65535.
`warning-only`	Specifies generating and logging a warning message without disconnecting the BGP session when the prefix limit is exceeded.

Examples

Setting the prefix limit to 1000 prefixes:

```
switch(config-bgp-ipv4-uc)# neighbor 10.0.0.1 maximum-prefix 1000
```

Enabling logging of a warning message when more than 1000 prefixes are received:

```
switch(config-bgp-ipv4-uc)# neighbor 10.0.0.1 maximum-prefix 1000 warning-only
```

Setting the prefix limit to 1000 prefixes and enabling logging of a warning message when 500 prefixes are received:

```
switch(config-bgp-ipv4-uc)# neighbor 10.0.0.1 maximum-prefix 1000 threshold 50
```

Setting the prefix limit to 1000 prefixes and enabling logging of a warning message when 500 prefixes are received and a second warning when the prefix limit is exceeded without disconnecting the session:

```
switch(config-bgp-ipv4-uc)# neighbor 10.0.0.1 maximum-prefix 1000 threshold 50
warning-only
```

Removing the threshold value:

```
switch(config-bgp-ipv4-uc)# no neighbor 10.0.0.1 maximum-prefix 1000 threshold 50
```

Disabling the maximum-prefix feature:

```
switch(config-bgp-ipv4-uc)# no neighbor 10.0.0.1 maximum-prefix
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor next-hop-self

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} next-hop-self
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} next-hop-self
```

Description

Configures the router as the next hop for a BGP-speaking neighbor or peer group, and enables BGP to send itself as the next hop for advertised routes.

The **no** form of this command resets the peer next-hop-self status to default. The next hop is generated based on the IP.

Parameter	Description
<IP-ADDR>	Specifies the neighbor's IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<PEER-GROUP-NAME>	Specifies a peer group.
`all`	Applies the configuration to all route-reflector clients.

Usage

- An administrator uses this command to make a BGP speaker fill its address when advertising routes to a BGP peer.
- This command is useful in non-meshed networks where BGP neighbors may not have direct access to all other neighbors on the same IP subnet.
- While advertising routes to eBGP peers, the next-hop is set to self IP by default. The default behavior can be changed by configuring next-hop-unchanged.
- While advertising routes to iBGP peers, the next-hop is kept unchanged by default. The default behavior can be changed by configuring next-hop-self.

Examples

Setting and resetting the router as the next hop self for neighbor 1.1.1.1:

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 next-hop-self
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 next-hop-self
```

Setting and resetting the router as the next hop self for its peer group:

```
switch(config-bgp-ipv4-uc)# neighbor pg next-hop-self
switch(config-bgp-ipv4-uc)# no neighbor pg next-hop-self
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor next-hop-unchanged

```
neighbor <IP-ADDRESS> next-hop-unchanged
no neighbor <IP-ADDRESS> next-hop-unchanged
```

Description

Enables the neighbor to preserve next-hop while advertising routes to eBGP peers, in the L2VPN EVPN address-family.

The **no** form of this command resets the peer next-hop-unchanged status to default.

Parameter	Description
<IP-ADDRESS>	Specifies the neighbor IP address in the IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or in the IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. **NOTE:** IPv6 MP-BGP peering must not be used for L2VPN EVPN address family, because VXLAN tunnel interface does not support IPv6 addresses.

Examples

```
switch(config-bgp-l2vpn-evpn)# neighbor 1.1.1.1 next-hop-unchanged
```

```
switch(config-bgp-l2vpn-evpn)# neighbor 2001:0db8:85a3::8a2e:0370:7334 next-hop-
unchanged
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-l2vpn-evpn`	Administrators or local user group members with execution rights for this command.

neighbor orf prefix-list in

```
neighbor <IP-ADDRESS> orf-prefix-list <PREFIX-LIST-NAME> in
no neighbor <IP-ADDRESS> orf-prefix-list <PREFIX-LIST-NAME> in
```

Description

Applies an inbound prefix list filter to filter the distribution of BGP neighbor information.

The **no** form of this command restores the default behavior of not applying the prefix list filter.

This command must be used only along with the ORF capability to take effect.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
`orf-prefix-list` *PREFIX-LIST-NAME>*	Sends the prefix list name to be filtered.

Usage

To use this command, the following conditions must be met:

- If route-map inbound is also applied on multiple neighbors along with ORF, then the route-map name must be common on all the neighbors.
- If route-map inbound is also applied on an IPv6 AF BGP neighbor, then the route-map sequence number with value 1 cannot be used.

Examples

Applying the inbound prefix list filter:

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 orf-prefix-list ABC in
```

Removing the inbound prefix list filter:

```
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 orf-prefix-list ABC in
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor passive

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} passive
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} passive
```

Description

Configures a specific neighbor, or all neighbors in a peer-group, as passive, which means that they will not initiate the TCP session.

The neighbor connection must be reset using `clear ip bgp` for this setting to take effect.

The **no** form of this command enables the neighbor to initiate the TCP session.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 passive
switch(config-bgp)# no neighbor 1.1.1.1 passive
```

```
switch(config-bgp)# neighbor pg passive
switch(config-bgp)# no neighbor pg passive
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-bgp	Administrators or local user group members with execution rights for this command.

neighbor password

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>}
         password [{ciphertext | plaintext} <PASSWORD>]
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>}
            password [ciphertext <PASSWORD>]
```

Description

Enables message digest5 (MD5) authentication on a TCP connection between two BGP neighbors. When the password is applied to a peer-group, all the neighbors that are part of peer-group inherit the configured setting.

The neighbor connection must be reset using `clear ip bgp <NEIGHBOR-IP-ADDR>` to allow this configuration to take effect.

The **no** form of this command removes the neighbor password.

Parameter	Description
<IP-ADDR>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a Peer-Group.
{ciphertext | plaintext}	Selects the password format.
<PASSWORD>	Specifies the password.

When the password is not provided on the command line, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

Examples

Enabling message digest5 (MD5) authentication for a neighbor with a provided plaintext password:

```
switch(config-bgp)# neighbor 1.1.1.1 password plaintext doubt_Plane#93
```

Enabling message digest5 (MD5) authentication for a neighbor with a prompted plaintext password:

```
switch(config-bgp)# neighbor 1.1.1.5 password
```

```
Enter the neighbor password: *************
Re-Enter the neighbor password: *************
```

Enabling message digest5 (MD5) authentication for a peer group with a provided plaintext password:

```
switch(config-bgp)# neighbor pg_3 password plaintext doubt_Plane#93
```

Disabling message digest5 (MD5) authentication for a neighbor:

```
switch(config-bgp)# no neighbor 1.1.1.5 password
```

Disabling message digest5 (MD5) authentication for a peer group:

```
switch(config-bgp)# no neighbor pg_3 password
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor port

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} port <NUMBER>
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} port
```

Description

Sets a custom TCP port on which to communicate with the BGP neighbor.

When this configuration is applied for peer-group, all the neighbors that are part of peer-group will inherit this setting. Though the neighbor inherits the configuration from the peer-group, the neighbor-specific command, if configured, takes precedence.

This setting only takes effect after a hard reset of the session.

The **no** form of this command allows a random TCP port to be selected for the communication with the BGP neighbor.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
port *<NUMBER>*	Specifies a TCP port number. Range: 0 to 65535.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 port 1500
switch(config-bgp)# no neighbor 1.1.1.1 port
```

```
switch(config-bgp)# neighbor PG port 1500
switch(config-bgp)# no neighbor PG port
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-bgp	Administrators or local user group members with execution rights for this command.

neighbor remote-as

```
neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} remote-as <AS-NUMBER>
no neighbor {<IP-ADDR>|<PEER-GROUP-NAME>} remote-as <AS-NUMBER>
```

Description

Creates a peer, initiates the connection to the peer, and adds an entry to the BGP neighbor table. Specifies a neighbor with an autonomous system (AS) number that identifies the neighbor as internal to the local autonomous system. Otherwise, the neighbor is considered as external. By default, neighbors that are defined using this command, exchange only unicast address prefixes.

The **no** form of this command disables the peer session and deletes the peer information.

Parameter	Description
<IP-ADDR>	Speciies an IP address.

Parameter	Description
<PEER-GROUP-NAME>	Specifies a peer group.
`remote-as <AS-NUMBER>`	Specifies a 4-byte AS number in asplain format (z), or asdot format (x.y), where z is a number from 1 to 4294967295 and x and y are 16-bit numbers in the range 0 to 65535.

Usage

The configured peer AS number is compared with the AS number received in the open message and a peer session is initiated only if both the AS numbers match.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 remote-as 1
switch(config-bgp)# no neighbor 1.1.1.1 remote-as 1
```

```
switch(config-bgp)# neighbor pg remote-as 1
switch(config-bgp)# no neighbor pg remote-as 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor remove-private-AS

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} remove-private-AS
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} remove-private-AS
```

Description

This command forces the BGP neighbor to drop the private AS numbers. When the outbound update contains a sequence of private AS numbers, this sequence is dropped. If the command is configured for peer-group, then all the neighbors that are part of peer-group will remove the private-AS before sending the BGP update message.

The **no** form of this command allows the private-AS number to be carried in BGP update message.

The neighbor connection must be reset using `clear ip bgp neighbor-ip-address` to allow this configuration to take effect.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 remove-private-AS
switch(config-bgp)# no neighbor 1.1.1.1 remove-private-AS
```

```
switch(config-bgp)# neighbor PG remove-private-AS
switch(config-bgp)# no neighbor PG remove-private-AS
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor route-map

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} route-map <MAP-NAME> {in|out}
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} route-map <MAP-NAME> {in|out}
```

Description

This command applies a route map to incoming or outgoing routes. It configures the route map for modifying the default attributes of the route.

When both peer group and neighbor configuration have route maps associated, then the following configuration applies:

- For outbound route maps, peer group configuration will override the configuration of the neighbor.
- For inbound route maps, neighbor configuration will override the peer group configuration.

The **no** form of this command removes a route map.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
<MAP-NAME>	Specifies the name of the route map.
`in|out`	Sets the route map policy to apply to either the received routes from the neighbor (`in`) or the advertised routes to the neighbor (`out`).

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 route-map HPE in
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 route-map HPE in
```

```
switch(config-bgp-ipv4-uc)# neighbor PG route-map HPE in
switch(config-bgp-ipv4-uc)# no neighbor PG route-map HPE in
```

```
switch(config)# route-map Rmap permit seq 10
switch(config-route-map-Rmap-10)# match metric 100
switch(config-route-map-bgp-10)# router bgp 100
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 remote-as 100
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 route-map Rmap out
```

Configuring inbound route maps in L2VPN EVPN address family.

```
switch(config)# router bgp 100
switch(config-bgp)# neighbor 2.1.1.1 remote-as 100
switch(config-bgp)# neighbor 2.1.1.1 update-source loopback 1
switch(config-bgp)# address-family l2vpn evpn
switch(config-bgp-l2vpn-evpn)# neighbor 2.1.1.1 activate
switch(config-bgp-l2vpn-evpn)# neighbor 2.1.1.1 route-map Rmap in
switch(config-bgp-l2vpn-evpn)# neighbor 2.1.1.1 send-community extended
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300	`config-bgp-ipv4-uc`	Administrators or local user group members with execution

Platforms	Command context	Authority
6400	`config-bgp-ipv6-uc` `config-bgp-l2vpn-evpn`	rights for this command.

neighbor route-reflector-client

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} route-reflector-client
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} route-reflector-client
```

Description

This command configures the router as a BGP route reflector and the specified peer as its client. The **no** form of this command disables this function.

Parameter	Description
<IP-ADDRESS>	Specifies the neighbor IP address in the IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or in the IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. **NOTE:** Pv6 MP-BGP peering must not be used for L2VPN EVPN address family, because VXLAN tunnel interface does not support IPv6 addresses.
<PEER-GROUP-NAME>	Specifies a peer group.

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 route-reflector-client
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 route-reflector-client
```

```
switch(config-bgp-ipv4-uc)# neighbor PG route-reflector-client
switch(config-bgp-ipv4-uc)# no neighbor PG route-reflector-client
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300	`config-bgp-ipv4-uc`	Administrators or local user group members with execution

Platforms	Command context	Authority
6400	`config-bgp-ipv6-uc` `config-bgp-l2vpn-evpn`	rights for this command.

neighbor send-community

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} send-community [standard | extended]
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} send-community [standard | extended]
```

Description

This command allows community values to be sent to a specific neighbor. When this command is configured for the peer-group, then all the neighbors that are part of peer-group will send the community values to the peers. The parameters `standard` and `extended` send only the respective community numbers. When the command is issued without either of these parameters, both standard and extended communities will be sent to the neighbor.

The **no** form of this command will not allow the neighbor to send community values to the specific neighbors that are part of peer-group.

Parameter	Description
<IP-ADDRESS>	Specifies the neighbor IP address in the IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or in the IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. **NOTE:** IPv6 MP-BGP peering must not be used for L2VPN EVPN address family, because VXLAN tunnel interface does not support IPv6 addresses.
<PEER-GROUP-NAME>	Specifies a peer group.

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 send-community standard
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 send-community standard
```

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 send-community extended
switch(config-bgp-ipv4-uc)# no neighbor 1.1.1.1 send-community
```

```
switch(config-bgp-ipv4-uc)# neighbor PG send-community standard
switch(config-bgp-ipv4-uc)# no neighbor PG send-community standard
```

```
switch(config-bgp-ipv4-uc)# neighbor PG send-community extended
switch(config-bgp-ipv4-uc)# no neighbor PG send-community
switch(config-bgp-l2vpn-evpn)# neighbor 1.1.1.1 send-community standard
switch(config-bgp-l2vpn-evpn)# no neighbor 1.1.1.1 send-community standard
```

```
switch(config-bgp-l2vpn-evpn)# neighbor 1.1.1.1 send-community extended
switch(config-bgp-l2vpn-evpn)# no neighbor 1.1.1.1 send-community
```

```
switch(config-bgp-l2vpn-evpn)# neighbor PG send-community standard
switch(config-bgp-l2vpn-evpn)# no neighbor PG send-community standard
```

```
switch(config-bgp-l2vpn-evpn)# neighbor PG send-community extended
switch(config-bgp-l2vpn-evpn)# no neighbor PG send-community
```

```
switch(config-bgp-l2vpn-evpn)# neighbor 2001:0db8:85a3::8a2e:0370:7334 send-
community extended
switch(config-bgp-l2vpn-evpn)# no neighbor 2001:0db8:85a3::8a2e:0370:7334 send-
community
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-bgp-ipv4-uc config-bgp-ipv6-uc	Administrators or local user group members with execution rights for this command.

neighbor shutdown

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} shutdown
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} shutdown
```

Description

This command disables the peer session, terminates any active session for the specified neighbor or peer group, and removes all associated routing information. This action can cause the sudden termination of many peering sessions.

The **no** form of this command enables the peer session for the specified neighbor.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.

Usage

Sessions are gracefully shut down when graceful-shutdown is enabled. Enter the `neighbor graceful-shutdown` command to enable graceful-shutdown. If graceful-shutdown is configured without delay or local-preference, the default values are used.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 shutdown
switch(config-bgp)# no neighbor 1.1.1.1 shutdown
```

```
switch(config-bgp)# neighbor pg shutdown
switch(config-bgp)# no neighbor pg shutdown
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor slow-peer

```
neighbor {<IP-ADDR>|<IPV6-ADDR>} slow-peer
no neighbor {<IPV4-ADDR>|<IPV6-ADDR>} slow-peer
```

Description

Slow peer configuration moves the peer from its normal update group to a slow update group. Removing slow peers allows the normal update group to function without being slowed down and enables faster convergence. Slow peer configuration is applicable only to explicitly configured BGP neighbors. All configured slow peers will be grouped into a slow update group. This group will converge based on the slowest group peer. Dynamic detection and splitting isn't supported. Peers can be statically configured as slow.

The **no** form of this command removes the slow peer configuration.

Parameter	Description
<IP-ADDR>	Specifies a neighbor IP address.
<IPV6-ADDR>	Specifies a neighbor IPv6 address.

Examples

Configuring a neighbor with an IP address of **1.1.1.1** as a slow peer:

```
switch(config-bgp)# neighbor 1.1.1.1 slow-peer
```

Removing the slow peer configuration for a neighbor with an IP address of **1.1.1.1**:

```
switch(config-bgp)# no neighbor 1.1.1.1 slow-peer
```

Configuring a neighbor with an IPv6 address of **2001::2** as a slow peer:

```
switch(config-bgp)# neighbor 2001::2 slow-peer
```

Removing the slow peer configuration for a neighbor with an IPv6 address of **2001::2**:

```
switch(config-bgp)# no neighbor 2001::2 slow-peer
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	config-bgp	Administrators or local user group members with execution rights for this command.

neighbor soft-reconfiguration inbound

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} soft-reconfiguration inbound
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} soft-reconfiguration inbound
```

Description

This command enables you to generate inbound updates from a neighbor and change and activate BGP policies without clearing the BGP session. Changes in BGP policies require the BGP session to be cleared which can have a large negative impact on network operations.

The **no** form of this command disables this setting.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.

Usage

- To perform inbound soft reconfiguration, the BGP speaker must store all received route updates, regardless of the current inbound policy.
- When inbound soft reconfiguration is enabled, the stored updates are processed by the new policy configuration to create new inbound updates.

Examples

```
switch(config-bgp-ipv4-uc)# neighbor 1.1.1.1 soft-reconfiguration inbound
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

neighbor timers

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} timers <KEEPALIVE> <HOLDTIME>
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} timers <KEEPALIVE> <HOLDTIME>
```

Description

This command sets the timers for a specific BGP neighbor or peer group. When the timer is applied to peer-group then all the neighbors that are part of peer-group will inherit the value configured.

The neighbor connection must be reset using `clear ip bgp <NEIGHBOR-IP-ADDRESS>` to allow this configuration to take effect.

The **no** form of this command clears the timers for a specific BGP neighbor or peer group.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
<KEEPALIVE>	Specifies the Keep-Alive timer value for the neighbor. Default: 60 seconds. Range: 0-65535.
<HOLDTIME>	Specifies the Hold-timer value. Default: 180 seconds. Range: 0-65535.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 timers 120 360
switch(config-bgp)# no neighbor 1.1.1.1 timers
```

```
switch(config-bgp)# neighbor pg timers 120 360
switch(config-bgp)# no neighbor pg timers
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor ttl-security-hops

```
neighbor {<IP-ADDRESS> | <PEER-GROUP-NAME>} ttl-security-hops <HOP-COUNT>
no neighbor {<IP-ADDRESS> | <PEER-GROUP-NAME>} ttl-security-hops <HOP-COUNT>
```

Description

This command enables BGP to establish connection with external peers residing on networks that are not directly connected. By enabling this feature, the received TTL from a BGP peer is compared with the difference "255 - *hop-count*". BGP messages coming with a TTL less than this value are not accepted. BGP peering will not be established if the TTL in the session establishment is received with a lower value. Also, by enabling this feature the router will send BGP packets with TTL value of 255 to the neighbor. For a neighbor, either TTL security or `ebgp-multihop` can be configured, not both together. If there are multiple paths to reach the node, then the hop count should be configured considering the longest route.

The **no** form of this command disables the peer ttl-security-hop feature.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
<HOP-COUNT>	Specifies the hop count to reach the neighbor for the eBGP session. Range: 1-255.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 ttl-security-hops 10
switch(config-bgp)# no neighbor 1.1.1.1 ttl-security-hops
```

```
switch(config-bgp)# neighbor pg ttl-security-hops 5
switch(config-bgp)# no neighbor pg ttl-security-hops
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp`	Administrators or local user group members with execution rights for this command.

neighbor update-source

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>}
     update-source {<IPv4>|<IPv6> | loopback <NUMBER>}
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>}
     update-source [<IPv4>|<IPv6> | loopback <NUMBER>]
```

Description

This command specifies the source address to reach the neighbor.

An iBGP connection can occur as long as there is a TCP/IP path between the routers. If multiple paths exist between the iBGP routers, using a loopback interface as the neighbor address can add stability to the network. With this command, stability can be achieved by providing the loopback interface address as the source address of the TCP/IP session.

The **no** form of this command negates the route updates of the neighbor.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
<IPV4>	Specifies an interface by IPv4 address.
<IPV6>	Specifies an interface by IPv6 address.
loopback *<NUMBER>*	Specifies a loopback interface number.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 update-source loopback 1
switch(config-bgp)# no neighbor 1.1.1.1 update-source
```

```
switch(config-bgp)# neighbor PG update-source loopback 1
switch(config-bgp)# no neighbor PG update-source
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-bgp	Administrators or local user group members with execution rights for this command.

neighbor weight

```
neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} weight <WEIGHT-VALUE>
no neighbor {<IP-ADDRESS>|<PEER-GROUP-NAME>} weight <WEIGHT-VALUE>
```

Description

This command assigns a weight to a neighbor connection. When the weight is applied to a peer-group then all the neighbors that are part of the peer-group will inherit the value configured.

The **no** form of this command removes a weight assignment.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
<PEER-GROUP-NAME>	Specifies a peer group.
<WEIGHT-VALUE>	Specifies the weigh to be associated with the routes received from the neighbor. Range: 0-65535.

Examples

```
switch(config-bgp)# neighbor 1.1.1.1 weight 500
switch(config-bgp)# no neighbor 1.1.1.1 weight
```

```
switch(config-bgp)# neighbor pg weight 600
switch(config-bgp)# no neighbor pg weight
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-bgp	Administrators or local user group members with execution rights for this command.

network

```
network {[<IPV4/MASK> | <IPV6/MASK>]} [route-map <ROUTE-MAP-NAME>]
no network {[<IPV4/MASK> | <IPV6/MASK>]} [route-map <ROUTE-MAP-NAME>]
```

Description

This command specifies the networks to be advertised by the Border Gateway Protocol (BGP) routing processes.

The **no** form of this command removes an entry from the routing table.

Parameter	Description
<IPV4/MASK>	Specifies the IPv4 network with mask. For example: 1.1.1.1/24
<IPV6/MASK>	Specifies the IPv6 network with mask. For example: 2001:0db8:85a3::8a2e:0370:7334/24

Parameter	Description
`route-map <ROUTE-MAP-NAME>`	Optional parameter. Specifies a route map to apply to the prefixes advertised by this specific network statement.

Usage

- This command is used to advertise prefixes currently installed in the routing table into the BGP table.
- Use the `route-map` keyword to apply the specified route map to network advertisements. The mask length as configured in the network statement must match the mask length of prefixes in the routing table.

Examples

```
switch(config-bgp-ipv4-uc)# network 11.11.11.0/24
switch(config-bgp-ipv4-uc)# no network 11.11.11.0/24
```

```
switch(config-bgp-ipv6-uc)# network 2001:0db8:85a3::8a2e:0370:7334/24
switch(config-bgp-ipv6-uc)# no network 2001:0db8:85a3::8a2e:0370:7334/24
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

redistribute

```
redistribute {connected|ospf <process ID> |static|local loopback} [route-map <ROUTE-MAP-NAME>]
no redistribute {connected|ospf <process ID> |static|local loopback} [route-map <ROUTE-MAP-NAME>]
```

Description

This command specifies routes to import into BGP. This command causes routes from the specified protocol to be considered for redistribution into BGP.

The **no** form of this command specifies no redistribution into BGP.

Parameter	Description
`connected`	Redistributes directly attached networks (directly attached to the subnet or host).
`ospf`	Redistributes Open Shortest Path First (OSPFv2) routes. It is optional to mention the process ID. Range: <1-65535>
`static`	Redistributes statically configured routes .
`local loopback`	Performs the following functions: ■ Redistributes local routes on loopback interfaces. ■ For EVPN enabled VRFs, it advertises the IP address of loopback interfaces as a EVPN Type-5 prefix route.
`route-map` *`<ROUTE-MAP-NAME>`*	Optional. Specifies a route map to match for redistribution.

Usage

- If a route map is specified, then routes that pass the match clause specified in the route map will be imported into the BGP peer Routing Information Base (RIB).
- Route-maps must be configured prior to being referenced in redistribution statements.
- Redistribute connected is required to redistribute connected subnet even if redistribute local loopback is already configured.

Examples

Redistribute directly attached networks:

```
switch(config-bgp-ipv4-uc)# redistribute connected
switch(config-bgp-ipv4-uc)# no redistribute connected
```

Redistributing local routes on loopback interfaces:

```
switch(config-bgp-ipv4-uc)# redistribute local loopback
switch(config-bgp-ipv4-uc)# no redistribute local loopback
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.12	Added support for the `host-routes` parameter.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-bgp-ipv4-uc` `config-bgp-ipv6-uc`	Administrators or local user group members with execution rights for this command.

router bgp

```
router bgp <AS-NUMBER>
no router bgp <AS-NUMBER>
```

Description

This command configures the BGP instance on the router, configures the AS (Autonomous System) the router belongs to, and enters into the BGP router configuration mode. Only a single BGP AS number can be assigned for the entire system.

The **no** form of the command deletes the BGP instance from the router.

Parameter	Description
AS-NUMBER	Specifies a 4-byte AS number in the range 1-4294967295 in integer format or from 0.1-65535.65535 in dotted format.

Examples

Configuring the BGP instance with the AS number:

```

```

Deleting BGP configurations:

```
switch(config)# no router bgp 100
This will delete all BGP configurations on this device.
Continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

set extcommunity

```
set extcommunity "[rt <VALUE> | evpn-rmac <MAC-ADDRESS>]"
no set extcommunity [rt | evpn-mac]
```

Description

Sets the extended community number attribute for a route matching the route map. Extended communities are supported only on Route Targets. This command is applicable to OSPF, static, and connected routes which will be redistributed to the BGP protocol.

The **no** form of this command restores the default behavior of not modifying the extended community number attribute of the route.

Parameter	Description
<VALUE>	Sets the extended community number attribute. Specify the information in asn:nn format.
<MAC-ADDRESS>	Specifies MAC address of the Router-MAC extended community. When configuring a route map and using the **set ip next-hop** command. this value can be set for the OUT direction only.

Usage

- Multiple community numbers can be configured within the double quotes.
- 2-byte and 4-byte ASN values are supported in the global administrator component of the extended community attribute.
- 4-byte ASN values must be within the range of 1-4294967295.
- 4-byte ASN values do not support dotted notation.
- Extended communities are only supported on route targets.
- The

Examples

Configuring a set clause in a route-map to modify the community number attribute of the route:

```
switch(config)# route-map abc permit seq 10
switch(config-route-map-abc-10)# set extcommunity rt "1:1 2:2"
```

Configuring a set clause in a route-map to modify the router mac:

```
switch(config)# route-map abc permit seq 1
switch(config-route-map-abc-1)# set extcommunity evpn-mac 00:01:01:90:90:01
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6400	config-route-map-abc-10	Administrators or local user group members with execution rights for this command.

show bgp

```
show bgp [{vrf <VRF-NAME>|all-vrf}] [{ipv4 unicast|ipv6 unicast
     |all}] [vsx-peer][update-group [<INDEX>]]
show bgp l2vpn evpn
```

Description

This command shows entries in the BGP routing table.

Parameter	Description
`ipv4`	Selects the IPv4 address family.
`ipv6`	Selects the IPv6 address family.
`unicast`	The subaddress family identifier.
`vrf <VRF-NAME>`	Select to display information by VRFs by specifying the VRF name.
`all-vrf`	Select to display the BGP summary information for all VRFs and address-families.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
`update-group [<INDEX>]`	Select to display information about update-group and peers which are member of that update-group for given afi/safi. Specifying an integer defines the desired update-group index.

Examples

Showing BGP routing table information for VRF 1 IPv4 unicast:

```
switch# show bgp vrf v1 ipv4 unicast
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
             i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : v1
Local Router-ID 9.0.0.1

    Network            Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2        0          100        0      65534.65535 3.4
18.54934 3574.8570 5.6 ?
*>e 100.0.0.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.1.0/24       9.0.0.2        0          100        0      200 ?
```

```
*>e 100.0.2.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.3.0/24       9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24       9.0.0.3        0          100        0      200 ?
Total number of entries 6
```

Showing BGP routing table information for L2VPN EVPN:

```
switch# show bgp l2vpn evpn

Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]

VRF : default
Router-ID not configured

     Network                                                   Nexthop
Metric LocPrf Weight Path
----------------------------------------------------------------------------------
----------------------
Route Distinguisher: 10.1.1.54:32967    (L2VNI 30000)
*>   [2]:[0]:[0]:[00:06:f6:3f:e3:c1]:[]                        1.1.1.20        0
   100    32768  i
*>   [2]:[0]:[0]:[8c:60:4f:f2:f5:41]:[]                        1.1.1.10        0
   100    0      i
*>   [3]:[0]:[1.1.1.1]                                         0.0.0.0         0
   100    0      ?
Total number of entries 3
```

BGP routing information for a network that includes both IPv4 and IPv6 addresses.

```
switch# show bgp l2vpn evpn vtep 1920:1680:1:1::4 vni 1001001
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]
EVPN Route-Type 5 prefix: [5]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]
VRF : default
Local Router-ID 192.168.1.1
Network                                               Nexthop         Metric
LocPrf    Weight   Path
----------------------------------------------------------------------------------
--------------------------
Route Distinguisher: 192.168.1.4:1001      (L2VNI 1001001)
*>i [2]:[0]:[0]:[00:aa:bb:cc:11:01]:[100.1.1.1]            1920:1680:1:1::4
0          100        0       ?
* i [2]:[0]:[0]:[00:aa:bb:cc:11:01]:[100.1.1.1]            1920:1680:1:1::4
0          100        0       ?
*>i [2]:[0]:[0]:[00:aa:bb:cc:11:01]:[1000:1:1:1::1]        1920:1680:1:1::4
0          100        0       ?
* i [2]:[0]:[0]:[00:aa:bb:cc:11:01]:[1000:1:1:1::1]        1920:1680:1:1::4
0          100        0       ?
*>i [2]:[0]:[0]:[00:aa:bb:cc:11:01]:[fe80:0:1::1]          1920:1680:1:1::4
0          100        0       ?
* i [2]:[0]:[0]:[00:aa:bb:cc:11:01]:[fe80:0:1::1]          1920:1680:1:1::4
0          100        0       ?
```

```
*>i [3]:[0]:[1920:1680:1:1::4]                             1920:1680:1:1::4
0          100        0       ?
* i [3]:[0]:[1920:1680:1:1::4]                             1920:1680:1:1::4
0          100        0       ?
Total number of entries 8
```

```
switch# show bgp l2vpn evpn neighbors 1920:1680:1:1::8
Codes: ^ Inherited from peer-group, * Dynamic Neighbor
VRF : default
BGP Neighbor 1920:1680:1:1::8 (Internal)
Description         : RR peer-group^
Peer-group          : RRv6
Remote Router Id    : 192.168.1.8        Local Router Id    : 192.168.1.1
Remote AS           : 65001              Local AS           : 65001
Remote Port         : 42423              Local Port         : 179
State               : Established        Admin Status       : Up
Conn. Established   : 5                  Conn. Dropped      : 4
Passive             : No                 Update-Source      : loopback0^
Cfg. Hold Time      : 180                Cfg. Keep Alive    : 60
Neg. Hold Time      : 180                Neg. Keep Alive    : 60
Up/Down Time        : 06h:46m:13s        Connect-Retry Time : 120
Local-AS Prepend    : No                 Alt. Local-AS      : 0
BFD                 : Disabled           Slow Peer          : Yes
Password            :
Last Err Sent       : No Error
Last SubErr Sent    : No Error
Last Err Rcvd       : No Error
Last SubErr Rcvd    : No Error
Graceful-Restart    : Enabled            Gr. Restart Time   : 120
Gr. Stalepath Time  : 300                Remove Private-AS  : No
TTL                 : 255                Local Cluster-ID   :
Weight              : 0                  Fall-over          : No
Confederation-Peers : No

Message statistics        Sent     Rcvd
-------------------      -----    -----
Open                         8        7
Notification                 3        1
Updates                  20730    91332
Keepalives                1153      952
Route Refresh                0        0
Total                    21894    92292

Capability                           Advertised      Received
----------------------------         -----------     ----------
Route Refresh                        Yes             Yes
Graceful Restart                     Yes             Yes
Add-Path                             No              No
Four Octet ASN                       Yes             Yes
Address family IPv4 Unicast          No              No
Address family IPv6 Unicast          No              No
Address family VPNv4 Unicast         No              No
Address family L2VPN EVPN            Yes             Yes
Address Family : L2VPN EVPN
-----------------------------
Rt. Reflect. Client : No                  Send Community    : extended^
Allow-AS in         : 0                   Advt. Interval    : 30
Max. Prefix         : 64000               Soft Reconfig In  :
Nexthop-Self        :                     Default-Originate :
Cfg. Add-Path       :
Neg. Add-Path       :
```

```
Routemap In          :
Routemap Out         :
ORF type             : Prefix-list
ORF capability       :
```

Showing all BGP update groups:

```
switch# show bgp all update-group

VRF : default

BGP Update-Group 1
    Address Family  : ipv4-unicast        Peering Type  : internal
    Peer Count      : 5                   Slow Group    : No

    Members
    -------
    110.162.100.221, 120.221.221.221, 130.121.21.111, 140.131.131.131,
    150.100.101.2

BGP Update-Group 2
    Address Family  : ipv4-unicast        Peering Type  : external
    Peer Count      : 2                   Slow Group    : Yes

    Members
    -------
    20.1.1.1, 30.1.1.1

BGP Update-Group 3
    Address Family  : ipv6-unicast        Peering Type  : external
    Peer Count      : 1                   Slow Group    : No

    Members
    -------
    20ab::cd:08
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp <PREFIX>

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast <A.B.C.D/M> |
     ipv6 unicast <X::Y/M>} [vsx-peer]
show bgp l2vpn evpn [RD-[ROUTE_TYPE]:[ESI]:[EthTag]:[MAC]:[OrigIP] |
                     RD-[ROUTE_TYPE]:[EthTag]:[OrigIP] |
                     RD-[ROUTE_TYPE]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]]
```

Description

This command displays entries in the BGP routing table that are part of the specified network. For EVPN Route-type 2 with MAC only prefix as an input, displays all the prefixes containing the specific MAC address (MAC route, MAC/IP route, Host route).

Parameter	Description
`vrf <VRF-NAME>`	Shows the information for a specified VRF.
`ipv4 unicast <A.B.C.D/M>`	Shows the information for an IPv4 unicast family with an IP prefix (network/length such as 35.0.0.0/8) in the BGP routing table to display.
`ipv6 unicast <X::Y/M>`	Shows the information for an IPv6 unicast family an IPv6 prefix in the BGP routing table to display.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
`l2vpn evpn`	Shows the information for L2VPN EVPN address family.
`RD-[ROUTE_TYPE]:[ESI]:[EthTag]:[MAC]:[OrigIP]`	EVPN Route-Type 2 prefix.
`RD-[ROUTE_TYPE]:[EthTag]:[OrigIP]`	EVPN Route-Type 3 prefix.
`RD-[ROUTE_TYPE]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]`	EVPN Route-Type 5 prefix.

Examples

Showing the entries in the BGP routing table that are part of an IPv4 unicast network

```
switch# show bgp ipv4 unicast 10.0.0.0/16

VRF : default
BGP Local AS 2         BGP Router-ID 1.1.1.2

   Network            : 10.0.0.0/16              Nexthop            : 1.1.1.1
   Peer               : 1.1.1.1                  Origin             : IGP
   Metric             : 0                        Local Pref         : 100
   Weight             : 0                        Calc. Local Pref   : 100
   Best               : Yes                      Valid              : Yes
   Type               : external                 Stale              : No
   Originator ID      : 0.0.0.0                  Path ID            : 0
   Aggregator ID      :
   Aggregator AS      :
   Atomic Aggregate   :
   RFD Flaps          : 0                        RFD Penalty        : 0

   AS-Path            : 1
   Cluster List      :
   Communities       :
50:100,50:101,50:102,50:103,50:104,50:105,50:106,50:107,50:108,50:109,50:110,50:1
   Extd. Communities :
```

Showing the entries in the BGP routing table that are part of L2VPN EVPN

```
switch# show bgp l2vpn evpn vni 30000
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]

VRF : default
Router-ID not configured

     Network                                                   Nexthop
Metric LocPrf Weight Path
---------------------------------------------------------------------------------
----------------------
Route Distinguisher: 10.1.1.54:32967    (L2VNI 30000)
*>   [2]:[0]:[0]:[00:06:f6:3f:e3:c1]:[]                        1.1.1.20        0
   100    32768  i
*>   [2]:[0]:[0]:[8c:60:4f:f2:f5:41]:[]                        1.1.1.10        0
   100    0      i
*>   [3]:[0]:[1.1.1.1]                                         0.0.0.0         0
   100    0      ?
Total number of entries 3
```

Showing the entries in the BGP routing table for EVPN route-type 2

```
switch# show bgp l2vpn evpn 2:2-[2]:[0]:[0]:[00:50:56:96:6d:6f]:[20.20.1.10]
VRF : default
BGP Local AS 1           BGP Router-id 3.3.3.3
Network            : 2:2-[2]:[0]:[0]:[00:50:56:96:6d:6f]:[20.20.1.10]
Nexthop            : 1.1.1.1
vni                : 2                         vni_type             : L2VNI
Peer               : 2.2.2.2                   Origin               : incomplete
Metric             : 0                         Local Pref           : 100
Weight             : 0                         Calc. Local Pref     : 100
Best               : Yes                       Valid                : Yes
Type               : internal                  Stale                : No
Originator ID      : 1.1.1.1                   Aggregator ID        :
Aggregator AS      :
Atomic Aggregate   :
AS-Path            :
Cluster List       :
Communities        :
Ext-Communities    : RT: 2:2 RT: 10:10 Router MAC: 00:00:00:00:00:11
Network            : 2:2-[2]:[0]:[0]:[00:50:56:96:6d:6f]:[20.20.1.10]
Nexthop            : 1.1.1.1
vni                : 10000                     vni_type             : L3VNI
Peer               : 2.2.2.2                   Origin               : incomplete
Metric             : 0                         Local Pref           : 100
Weight             : 0                         Calc. Local Pref     : 100
Best               : Yes                       Valid                : Yes
Type               : internal                  Stale                : No
Originator ID      : 1.1.1.1                   Aggregator ID        :
```

```
Aggregator AS       :
Atomic Aggregate    :
AS-Path             :
Cluster List        :
Communities         :
Ext-Communities     : RT: 2:2 RT: 10:10 Router MAC: 00:00:00:00:00:11
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.08	Added l2vpn evpn route types
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp community

`show bgp [{ipv4 | ipv6 | ipv4 {vrf <VRF-NAME>}} unicast] community [<VALUE> | <TYPE>]`

Description

This command shows routes that belong to BGP communities. Optionally you can specify displaying information by a specific community or by VRF.

Parameter	Description
`ipv4`	Shows the information for an IPv4 address family.
`ipv6`	Shows the information for an IPv6 address family.
`unicast`	Shows the information for a subaddress family identifier.
`ipv4 vrf <VRF-NAME>`	Shows the information for a specified VRF.
<VALUE>	Shows the information for a community number. Specify the information in `aa:nn` format.

<TYPE>	Shows a specified community type. Select the following well-known communities, as well as others:
	`internet`
	Advertise the prefix to all BGP neighbors.
	`local-as`

Parameter	Description

	Do not advertise the prefix outside the sub-AS.
	`no-advertise`
	Do not advertise the prefix to any BGP neighbors.
	`no-export`
	Do not advertise the prefix to any eBGP neighbors.

`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing information for routes that belong to all BGP communities:

```
switch# show bgp ipv4 unicast community
Status codes: s suppressed, d damped, h history, * valid, &gt; best, = multipath,i
internal, e external S Stale, R Removed, a additional-pathsVRF : defaultLocal
Router-ID 9.0.0.1
Network                Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*&gt;e 9.0.0.0/24      9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.0.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.1.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.2.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.3.0/24    9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24       9.0.0.3        0          100        0      200 ?
                       Total number of entries 6
```

Showing information for routes that belong to the 200:20 BGP community number:

```
switch# show bgp ipv4 unicast community 200:20
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
i internal, e external S Stale, R RemovedOrigin codes: i - IGP, e - EGP, ? -
incomplete
VRF : defaultLocal Router-ID 9.0.0.1

Network             Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24      9.0.0.2        0          100        0      200 ?
*>e 100.0.0.0/24    9.0.0.2        0          100        0      200 ?
*>e 100.0.1.0/24    9.0.0.2        0          100        0      200 ?
*>e 100.0.2.0/24    9.0.0.2        0          100        0      200 ?
*>e 100.0.3.0/24    9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24    9.0.0.3        0          100        0      200 ?
                       Total number of entries 6
```

Showing information for routes that belong to the Internet BGP community type:

```
switch# show bgp ipv4 unicast community internet
Status codes: s suppressed, d damped, h history, * valid, &gt; best, = multipath,
i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete
VRF : default
Local Router-ID 9.0.0.1
Network                Nexthop        Metric     LocPrf     Weight Path
```

```
-----------------------------------------------------------------------
*&gt;e 9.0.0.0/24      9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.0.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.1.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.2.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.3.0/24    9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24       9.0.0.3        0          100        0      200 ?
Total number of entries 6
```

Showing information for routes that belong to the local-as BGP community type:

```
switch# show bgp ipv4 unicast community local-as
Status codes: s suppressed, d damped, h history, * valid, &gt; best, = multipath,
i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete
VRF : default


Local Router-ID 9.0.0.1
Network                Nexthop        Metric     LocPrf     Weight Path
------------------------------------------------------------------------
*&gt;e 9.0.0.0/24      9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.0.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.1.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.2.0/24    9.0.0.2        0          100        0      200 ?
*&gt;e 100.0.3.0/24    9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24       9.0.0.3        0          100        0      200 ?
                       Total number of entries 6
```

Showing information for routes that belong to the no-advertise BGP community type:

```
switch# show bgp ipv4 unicast community no-advertise
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
i internal, e external S Stale, R Removed, a additional-pathsOrigin codes: i -
IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 9.0.0.1
Network            Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2        0          100        0      200 ?
*>e 100.0.0.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.1.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.2.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.3.0/24       9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24       9.0.0.2        0          100        0      200 ?
                       Total number of entries 6
```

Showing information for routes that belong to the no-export BGP community type:

```
switch# show bgp ipv4 unicast community no-export
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,i
internal, e external S Stale, R Removed, a additional-pathsOrigin codes: i - IGP,
e - EGP, ? - incomplete

VRF : default
Local Router-ID 9.0.0.1
```

```
Network            Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2        0          100        0      200 ?
*>e 100.0.0.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.1.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.2.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.3.0/24       9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24       9.0.0.3        0          100        0      200 ?
                       Total number of entries 6
```

Showing information for routes that belong to the gshut BGP community type:

```
switch# show bgp ipv4 unicast community gshut
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
i internal, e external S Stale, R RemovedOrigin codes: i - IGP, e - EGP, ? -
incomplete

VRF : default
Local Router-ID 1.1.1.2

Network            Nexthop         Metric     LocPrf     Weight Path
------------------------------------------------------------------------
*>e 1.1.1.0/24         10.1.1.2        0          0          0       2 i
Total number of entries 1

switch#
switch# show bgp ipv6 unicast community gshut

Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,i
internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 1.1.1.2

Network            Nexthop         Metric     LocPrf     Weight Path
------------------------------------------------------------------------
*>e 1::/64             10::2
fe80::98f2:b300:1368:e882
                               0          0          0       2 i
                       Total number of entries 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp flap-statistics

`show bgp {vrf <VRF_NAME> | all-vrf} [{ipv4 unicast | ipv6 unicast | all}] flap-statistics`

Description

Displays all the flapped and suppressed routes.

Usage

Status of the route with dampening enabled:

- If the route is available, the history flag is unset.
- If route has been flapping, is not suppressed and is withdrawn; the state of the route is `h`
- If route is currently available but is suppressed due to dampening, the state of the route is `d`
- If the route is unsuppressed and currently withdrawn, the state of the route is `h`

Examples

Showing all the flapped and suppressed routes:

```
switch# show bgp all
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 1.1.1.1

Address-family : IPv4 Unicast
-----------------------------
    Network            Nexthop         Metric     LocPrf     Weight Path
*>i 2.2.2.0/24         2.2.2.2         0          100        0       ?
*>i 11.1.1.0/24        2.2.2.2         0          100        0       ?
*ai 11.1.1.0/24        2.2.2.3         0          100        0       ?
Total number of entries 3

Address-family : IPv6 Unicast
-----------------------------
    Network            Nexthop         Metric     LocPrf     Weight Path
Total number of entries 0
```

```
switch# show bgp ipv4 unicast flap-statistics
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
             i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 20.0.0.1

    Network            Nexthop         Flaps         Reuse       Path
```

```
*>e 2.2.2.0/24         20.0.0.2        1          00h:00m:00s   300 ?
 de 3.3.3.0/24         20.0.0.2        2          00h:29m:31s   300 ?
Total number of entries 2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show bgp neighbor advertised-routes

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast | ipv6 unicast
      | all} neighbors <IP-ADDRESS>
      advertised-routes [vsx-peer]
show bgp l2vpn evpn neighbors <IP-ADDRESS> advertised-routes
```

Description

Shows all routes that have been advertised to the specified neighbor.

Parameter	Description
vrf *<VRF-NAME>*	Shows the information for a specified VRF.
ipv4 unicast	Shows the information for an IPv4 unicast address family.
ipv6 unicast	Shows the information for an IPv6 unicast address family.
l2vpn evpn	Shows the information for L2VPN EVPN address family.
all	Shows the information for all address families and subaddress families.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
<IP-ADDRESS>	Shows the information for a neighbor IP address.

Examples

Showing routes that have been advertised to the specified IPv4 unicast neighbor:

```
switch# show bgp ipv4 unicast neighbors 9.0.0.1 advertised-routes
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 9.0.0.2

    Network            Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2        0          0          0      200 65534.65535
3.4 18.54934 3574.8570 5.6 ?
*>e 100.0.0.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.1.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.2.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.3.0/24       9.0.0.2        0          0          0      200 ?
Total number of entries 5
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp neighbor paths

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast | ipv6 unicast
     | all} neighbors <IP-ADDRESS> paths [vsx-peer]
show bgp l2vpn evpn neighbors <IP-ADDRESS> paths
```

Description

Shows autonomous system paths learned from the specified neighbor.

Parameter	Description
`vrf <VRF-NAME>`	Shows the information for a specified VRF.
`ipv4 unicast`	Shows the information for an IPv4 unicast address family.
`ipv6 unicast`	Shows the information for an IPv6 unicast address family.
`all`	Shows the information for all address families and subaddress

Parameter	Description
	families.
<IP-ADDRESS>	Shows the information for a neighbor IP address.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
l2vpn evpn	Shows the information for L2VPN EVPN address family.

Examples

Showing autonomous system paths learned from the specified IPv4 unicast neighbor:

```
switch# show bgp ipv4 unicast neighbors 192.168.12.2 paths
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
VRF : default
Local Router-ID 9.0.0.1

    Network            Nexthop          Path
--------------------------------------------
*>e 9.0.0.0/24         9.0.0.2          200 65534.65535 3.4 18.54934 3574.8570 5.6
*>e 100.0.0.0/24       9.0.0.2          200
*>e 100.0.1.0/24       9.0.0.2          200
*>e 100.0.2.0/24       9.0.0.2          200
*>e 100.0.3.0/24       9.0.0.2          200
Total number of entries 5
```

Showing autonomous system paths learned from the specified L2VPN EVPN neighbor:

```
switch# show bgp l2vpn evpn neighbors 192.168.12.1 paths

Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]

VRF : default
Local Router-ID 9.0.0.2

     Network                                                   Nexthop         Path
----------------------------------------------------------------------------------
-
Route Distinguisher: 10.1.1.54:32967    (L2VNI 30000)
*>    [2]:[0]:[0]:[00:06:f6:3f:e3:c1]:[]                       1.1.1.20         100
*>    [2]:[0]:[0]:[8c:60:4f:f2:f5:41]:[]                       1.1.1.10         100
                       Total number of entries 2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp neighbor received orf-prefix-list

`show bgp [vrf <VRF-NAME>]{ipv4 unicast | ipv6 unicast | all} neighbors` *`<IP-ADDRESS>`* `received orf-prefix-list`

Description

Shows all the prefix lists received from the specified neighbor.

Parameter	Description
`vrf` *`<VRF-NAME>`*	Shows the information for a specified VRF.
`ipv4 unicast`	Shows the information for an IPv4 unicast address family.
`ipv6 unicast`	Shows the information for an IPv6 unicast address family.
`all`	Shows the information for all address families and subaddress families.
`<IP-ADDRESS>`	Shows the information for a neighbor IP address.

Examples

Showing received prefix list from the specified neighbor:

```
switch# show bgp ipv4 unicast neighbors A.B.C.D received orf-prefix-list
Address family: IPv4 Unicast

  ip prefix-list 10.0.0.200: 4 entries

     seq 10 permit 28.119.16.0/24

     seq 15 deny 28.119.19.0/24

     seq 20 permit 28.119.17.0/24

  Address family: IPv6 Unicast

  ip prefix-list 10.0.0.200: 4 entries

       seq 30 permit 2000::/64

       seq 35 deny 3000::/64
```

```
        seq 40 permit 4000:0/64
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp neighbor received-routes

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast | ipv6 unicast
     | all} neighbors <IP-ADDRESS> received-routes [vsx-peer]
show bgp l2vpn evpn neighbors <IP-ADDRESS> received-routes
```

Description

Shows received routes from the specified neighbor.

Parameter	Description
`vrf <VRF-NAME>`	Shows the information for a specified VRF.
`ipv4 unicast`	Shows the information for an IPv4 unicast address family.
`ipv6 unicast`	Shows the information for an IPv6 unicast address family.
`all`	Shows the information for all address families and subaddress families.
`<IP-ADDRESS>`	Shows the information for a neighbor IP address.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing received routes from the specified IPv4 unicast neighbor:

```
switch# show bgp ipv4 unicast neighbors 192.168.12.1 received-routes
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 9.0.0.2

    Network            Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2        0          0          0      200 65534.65535
3.4 18.54934 3574.8570 5.6 ?
*>e 100.0.0.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.1.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.2.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.3.0/24       9.0.0.2        0          0          0      200 ?
*ae 100.0.3.0/24       9.0.0.2        0          0          0      200 ?
Total number of entries 6
```

Showing received routes from the specified L2VPN EVPN neighbor:

```
switch# show bgp l2vpn evpn neighbors 192.168.12.1 received-routes

Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]

VRF : default
Local Router-ID 9.0.0.2

     Network                                           Nexthop        Metric
LocPrf Weight Path
----------------------------------------------------------------------------------
----------------------
Route Distinguisher: 10.1.1.54:32967    (L2VNI 30000)
*>   [2]:[0]:[0]:[00:06:f6:3f:e3:c1]:[]                 1.1.1.20       0      100
  32768  i
*>   [2]:[0]:[0]:[8c:60:4f:f2:f5:41]:[]                 1.1.1.10       0      100
  0      i
Total number of entries 2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp neighbor routes

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast | ipv6 unicast
     | all} neighbors <IP-ADDRESS> routes [vsx-peer]
```

Description

This command shows routes that are received and accepted from the specified neighbor.

Parameter	Description
`vrf <VRF-NAME>`	Shows the information for a specified VRF.
`ipv4 unicast`	Shows the information for an IPv4 unicast address family.
`ipv6 unicast`	Shows the information for an IPv6 unicast address family.
`all`	Shows the information for all address families and subaddress families.
`<IP-ADDRESS>`	Shows the information for a neighbor IP address.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing all routes that are received and accepted from the specified neighbor:

```
switch# show bgp ipv4 unicast neighbors 9.0.0.2 routes
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 9.0.0.1

    Network            Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2        0          100        0      200  65534.65535
3.4 18.54934 3574.8570 5.6 ?
*>e 100.0.0.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.1.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.2.0/24       9.0.0.2        0          100        0      200 ?
*>e 100.0.3.0/24       9.0.0.2        0          100        0      200 ?
*ae 100.0.3.0/24       9.0.0.3        0          100        0      200 ?
Total number of entries 6
```

Showing 12 VPN EVPN routes that are received and accepted from the specified neighbor:

```
switch# show bgp l2vpn evpn neighbor 9.0.0.2 routes

Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
               i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]

VRF            : default
Local Router-id: 9.0.0.1

   Network            Nexthop        Metric     LocPrf     Weight Path
-----------------------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2        0          0          0      200 65534.65535
3.4 18.54934 3574.8570 5.6 ?
*>e 100.0.0.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.1.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.2.0/24       9.0.0.2        0          0          0      200 ?
*>e 100.0.3.0/24       9.0.0.2        0          0          0      200 ?
*ae 100.0.3.0/24       9.0.0.3        0          100        0      200 ?
Total number of entries 6
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp neighbors

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast | ipv6 unicast | all}
     neighbors [vsx-peer]
show bgp l2vpn evpn neighbors
```

Description

This command shows information about BGP and TCP connections to neighbors. If neighbors are member of a peer-group, the command shows the configured values inherited from the peer-group. The configured values are postfixed with a caret (^) for inherited values.

Parameter	Description
`vrf <VRF-NAME>`	Shows the information for a specified VRF.

Parameter	Description
ipv4 unicast	Shows the information for an IPv4 unicast address family.
ipv6 unicast	Shows the information for an IPv6 unicast address family.
all	Shows the information for all address families and subaddress families.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
l2vpn evpn	Shows the information for L2VPN EVPN address family.

Examples

Showing all information about BGP and TCP connections to neighbors:

```
switch# show bgp all neighbors
Codes: ^ Inherited from peer-group
VRF : default

BGP Neighbor 10.1.1.2 (Internal)
    Description             :
    Peer-group              :

    Remote Router Id    : 10.1.1.2           Local Router Id    : 1.0.0.1
    Remote AS           : 1                  Local AS           : 1
    Remote Port         : 0                  Local Port         : 0
    State               : Established        Admin Status       : Up
    Conn. Established   : 1                  Conn. Dropped      : 0
    Passive             : No                 Update-Source      :
    Cfg. Hold Time      : 180                Cfg. Keep Alive    : 60
    Neg. Hold Time      : 0                  Neg. Keep Alive    : 0
    Up/Down Time        : 00h:00m:00s        Connect-Retry Time : 120
    Local-AS Prepend    : No                 Alt. Local-AS      : 0
    BFD                 : Disabled           Slow Peer          : No
    Password            :
    Last Err Sent       : No Error
    Last SubErr Sent    : No Error
    Last Err Rcvd       : No Error
    Last SubErr Rcvd    : No Error

    Graceful-Restart    : Enabled            Gr. Restart Time   : 120
    Gr. Stalepath Time  : 150                Remove Private-AS  : No
    TTL                 : 255                Local Cluster-ID   :
    Weight              : 0                  Fall-over          : No

    Message statistics       Sent     Rcvd
    -------------------      -----    -----
    Open                         7        6
    Notification                 5        2
    Updates                      3        2
    Keepalives                   12       10
    Route Refresh                0        0
    Total                        28       20

    Capability                           Advertised      Received
    -----------                          -----------     ----------
    Route Refresh                        Yes             No
    Graceful Restart                     Yes             No
    Four Octet ASN                       Yes             No
    Add-Path                             Yes             Yes
    Address family IPv4 Unicast          Yes             No
    Address family IPv6 Unicast          No              No
    Address family L2VPN EVPN            No              No

    Address Family : IPv4 Unicast
    -----------------------------
    Rt. Reflect. Client : No                  Send Community    :
    Allow-AS in         : 0                   Advt. Interval    : 30
    Max. Prefix         : 64000               Soft Reconfig In  :
    Nexthop-Self        :                     Default-Originate :
    Update-Group        : 2

    Cfg. Add-Path       : Send and Receive
    Neg. Add-Path       : Send and Receive
    Routemap In         :
    Routemap Out        :
    ORF type            : Prefix-list
    ORF capability      : Receive

    Address Family : IPv6 Unicast
    -----------------------------
    Rt. Reflect. Client : No                  Send Community    :
    Allow-AS in         : 0                   Advt. Interval    : 30
    Max. Prefix         : 64000               Soft Reconfig In  :
    Nexthop-Self        :                     Default-Originate :
    Update-Group        : 3

    Cfg. Add-Path       : Send and Receive
    Neg. Add-Path       : Send and Receive
    Routemap In         :
    Routemap Out        :
    ORF type            : Prefix-list
    ORF capability      : Receive

    Address Family : L2VPN EVPN
    -----------------------------
    Rt. Reflect. Client : No                  Send Community    : extended
    Allow-AS in         : 0                   Advt. Interval    : 30
    Max. Prefix         : 32768               Soft Reconfig In  :
    Nexthop-Self        :                     Default-Originate :
    Update-Group        : 4

    Cfg. Add-Path       :
    Neg. Add-Path       :
    Routemap In         :
    Routemap Out        :
    ORF type            : Prefix-list
    ORF capability      : Receive
```

```
Showing information about L2VPN EVPN connections to neighbors:
                 switch# show bgp l2vpn evpn neighbors
Codes: ^ Inherited from peer-group, * Dynamic Neighbor

VRF : default

BGP Neighbor 10.1.1.2 (Internal)
    Description         :
```

```
    Peer-group          :

    Remote Router Id    : 10.1.1.2           Local Router Id    : 10.1.1.1
    Remote AS           : 1                  Local AS           : 1
    Remote Port         : 179                Local Port         : 56008
    State               : Established        Admin Status       : Up
    Conn. Established   : 1                  Conn. Dropped      : 0
    Passive             : No                 Update-Source      :
    Cfg. Hold Time      : 180                Cfg. Keep Alive    : 60
    Neg. Hold Time      : 180                Neg. Keep Alive    : 60
    Up/Down Time        : 00m:01w:03d        Alt. Local-AS      : 0
    Local-AS Prepend    : No
    BFD                 : Disabled
    Password            :
    Last Err Sent       : No Error
    Last SubErr Sent    : No Error
    Last Err Rcvd       : No Error
    Last SubErr Rcvd    : No Error

    Graceful-Restart    : Enabled            Gr. Restart Time   : 120
    Gr. Stalepath Time  : 150                Remove Private-AS  : No
    TTL                 : 255                Local Cluster-ID   :
    Weight              : 0                  Fall-over          : No

    Message statistics       Sent     Rcvd
    -------------------      -----    -----
    Open                         1        1
    Notification                 0        0
    Updates                      3        2
    Keepalives               17995    18009
    Route Refresh                0        0
    Total                    17999    18012

    Capability                           Advertised      Received
    -----------                          -----------     ----------
    Route Refresh                        Yes             Yes
    Graceful Restart                     Yes             Yes
    Four Octet ASN                       Yes             Yes
    Address family IPv4 Unicast          Yes             Yes
    Address family IPv6 Unicast          Yes             Yes
    Address family L2VPN EVPN            Yes             Yes

    Address Family : L2VPN EVPN
    -----------------------------

    Rt. Reflect. Client : No                  Send Community     : extended
    Allow-AS in         : 0                   Advt. Interval     : 30
    Max. Prefix         : 32768               Soft Reconfig In   :
    Nexthop-Self        :                     Default-Originate :

    Routemap In         :
    Routemap Out        :
```

Showing information for BGP IPv4 unicast neighbors:

```
switch# show bgp ipv4 unicast neighbors
Codes: ^ Inherited from peer-group

VRF : default

BGP Neighbor 10.1.1.2 (Internal)
```

```
Description         :
Peer-group          :

Remote Router Id    : 10.1.1.2           Local Router Id    : 1.0.0.1
Remote AS           : 1                  Local AS           : 1
Remote Port         : 0                  Local Port         : 0
State               : Idle               Admin Status       : Up
Conn. Established   : 0                  Conn. Dropped      : 0
Passive             : No                 Update-Source      :
Cfg. Hold Time      : 180                Cfg. Keep Alive    : 60
Neg. Hold Time      : 0                  Neg. Keep Alive    : 0
Up/Down Time        : 00h:00m:00s        Connect-Retry Time : 120
Local-AS Prepend    : No                 Alt. Local-AS      : 0
BFD                 : Disabled           Slow Peer          : Yes
Password            :
Last Err Sent       : No Error
Last SubErr Sent    : No Error
Last Err Rcvd       : No Error
Last SubErr Rcvd    : No Error

Graceful-Restart    : Enabled            Gr. Restart Time   : 120
Gr. Stalepath Time  : 150                Remove Private-AS  : No
TTL                 : 255                Local Cluster-ID   :
Weight              : 0                  Fall-over          : No

Message statistics       Sent     Rcvd
-------------------      -----    -----
Open                     0        0
Notification             0        0
Updates                  0        0
Keepalives               0        0
Route Refresh            0        0
Total                    0        0

Capability                           Advertised      Received
-----------                          -----------     ----------
Route Refresh                        Yes             No
Graceful Restart                     Yes             No
Four Octet ASN                       Yes             No
Add-Path                             Yes             Yes
Address family IPv4 Unicast          Yes             No
Address family IPv6 Unicast          No              No
Address family L2VPN EVPN            Yes             Yes

Address Family : IPv4 Unicast
-----------------------------

Rt. Reflect. Client : No                  Send Community    :
Allow-AS in         : 0                   Advt. Interval    : 30
Max. Prefix         : 64000               Soft Reconfig In  :
Nexthop-Self        :                     Default-Originate :
Update-Group        : 12

Routemap In         :
Routemap Out        :

ORF Type            : Prefix-list
ORF Capability      : Send

Cfg. Add-Path       : Send
Neg. Add-Path       : Send
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp paths

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast | ipv6 unicast | all}
     paths [vsx-peer]
show bgp l2vpn evpn paths
```

Description

Shows received BGP path information in the database.

Parameter	Description
`vrf <VRF-NAME>`	Shows the information for a specified VRF.
`ipv4 unicast`	Shows the information for an IPv4 unicast address family.
`ipv6 unicast`	Shows the information for an IPv6 unicast address family.
`all`	Shows the information for all address families and subaddress families.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
`l2vpn evpn`	Shows the information for L2VPN EVPN address family.

Examples

Showing received BGP path information from the specified IPv4 unicast neighbor:

```
switch# show bgp ipv4 unicast paths
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
             i internal, e external S Stale, R Removed, a additional-paths
VRF : default
Local Router-ID 9.0.0.1
```

```
    Network                Nexthop          PathID      Path
--------------------------------------------------------
*>e 9.0.0.0/24         9.0.0.2          0           200 65534.65535 3.4 18.54934
3574.8570 5.6
*>e 100.0.0.0/24       9.0.0.2          0           200
*>e 100.0.1.0/24       9.0.0.2          0           200
*>e 100.0.2.0/24       9.0.0.2          0           200
*>e 100.0.3.0/24       9.0.0.2          10          200
*ae  100.0.3.0/24      9.0.0.3          5           200
Total number of entries 6
```

Showing received BGP path information from the specified L2VPN EVPN neighbor:

```
switch# show bgp l2vpn evpn paths

Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]

VRF : default
Local Router-ID 9.0.0.2

     Network                                               Nexthop        Path
----------------------------------------------------------------------------------
Route Distinguisher: 10.1.1.54:32967    (L2VNI 30000)
*>   [2]:[0]:[0]:[00:06:f6:3f:e3:c1]:[]                    1.1.1.20         100
*>   [2]:[0]:[0]:[8c:60:4f:f2:f5:41]:[]                    1.1.1.10         100
Total number of entries 2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp peer-group summary

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast |
     ipv6 unicast | all} peer-group <PEER-GROUP-NAME>
     summary [vsx-peer]
show bgp l2vpn evpn peer-group <PEER-GROUP-NAME> summary
```

Description

This command shows the peer-group information in the database.

Parameter	Description
`vrf <VRF-NAME>`	Shows the information for a specified VRF.
`ipv4 unicast`	Shows the information for an IPv4 unicast address family.
`ipv6 unicast`	Shows the information for an IPv6 unicast address family.
`all`	Shows the information for all address families and subaddress families.
`<PEER-GROUP-NAME>`	Shows the information for the BGP peer-group for the BGP instance.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
`l2vpn evpn`	Shows the information for L2VPN EVPN address family. This parameter only applies to 8100, 8325, 9300, and 8360 series switches.

Examples

Showing the information from IPv4 unicast address families in `pg_name1` peer-group:

```
switch# show bgp ipv4 unicast peer-group pg_name1 summary
Codes: * Dynamic Neighbor
VRF : default
BGP Peer-Group Summary
=======================
 Local AS               : 1            BGP Router Identifier  : 2.2.2.2
 Peers                  : 1            Dynamic Peer Count     : 3
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60

 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 10.0.0.1        1         8       10      00h:00m:58s  Established Up
*10.1.1.5        11        15      14      00h:10m:24s  Established Up
```

Showing the information from all address families in `pg_name1` peer-group:

```
switch# show bgp all unicast peer-group pg_name1 summary
Codes: * Dynamic Neighbor
VRF : default
BGP Peer-Group Summary
=======================
 Local AS               : 1            BGP Router Identifier  : 2.2.2.2
 Peers                  : 1            Dynamic Peer Count     : 3
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60
 Confederation Id       : 0
For address family: IPv4 Unicast
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 10.0.0.1        1         8       10      00h:00m:58s  Established Up
*10.1.1.5        11        15      14      00h:10m:24s  Established Up
```

```
For address family: IPv6 Unicast
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
  1001::1002     11        12      12      00h:00m:07s  Established Up
  2001::2002     11        12      12      00h:00m:07s  Established Up
For address family: L2VPN EVPN
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
  10.0.0.1        1         8       10      00h:00m:58s  Established Up
  10.1.1.6        11        15      14      00h:10m:24s  Established Up
```

Showing the information from L2VPN EVPN address families in `pg_name1` peer-group:

```
switch# show bgp l2vpn evpn peer-group pg_name1 summary
VRF : default
BGP Peer-Group Summary
=======================
 Local AS               : 1            BGP Router Identifier  : 2.2.2.2
 Peers                  : 1            Dynamic Peer Count     : 3
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60
 Confederation Id       : 0


 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 10.0.0.1        1         8       10      00h:00m:58s  Established Up
*10.1.1.6        11        15      14      00h:10m:24s  Established Up
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp summary

```
show bgp [vrf <VRF-NAME>] {ipv4 unicast | ipv6 unicast | all}
     summary [vsx-peer]
show bgp l2vpn evpn summary
```

Description

This command shows a summary of the status of Border Gateway Protocol (BGP) connections.

Parameter	Description
`ipv4 unicast`	Selects to display the BGP summary information for the IPv4 subaddress family identifier.
`ipv6 unicast`	Selects to display the BGP summary information for the IPv6 subaddress family identifier.
`all`	Selects to display the BGP summary information for all VRFs and address-families.
`vrf` *`<VRF-NAME>`*	Selects to display information by VRFs by specifying the VRF name.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
`l2vpn evpn`	Shows the information for L2VPN EVPN address family. This parameter only applies to 8100, 8325, 9300, and 8360 series switches.

Examples

Showing BGP summary information for all address-families:

```
switch(config-bgp)# show bgp all summary
Codes: * Dynamic Neighbor
VRF : default
BGP Summary
 Local AS               : 100          BGP Router Identifier  : 9.0.0.1
 Peers                  : 1            Log Neighbor Changes   : No
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60
 Confederation Id       : 0

Address-family : IPv4 Unicast
-----------------------------
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 9.0.0.2         200       25      23      00h:17m:50s  Established Up
*10.1.1.5        11        26      24      00h:20m:26s  Established Up


Address-family : IPv6 Unicast
-----------------------------
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
*2001::2002      11        3       3       00h:00m:14s  Established Up
 9000::2         200       25      23      00h:17m:50s  Established Up


Address-family : VPNv4 Unicast
-----------------------------
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 1.1.1.1         100       207     208     02h:54m:18s  Established Up
*3.3.3.4         11        26      24      00h:20m:26s  Established Up

Address-family : L2VPN EVPN
-----------------------------
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 10.0.0.2        200       25      23      00h:17m:50s  Established Up
*10.1.1.6        11        26      24      00h:20m:26s  Established Up
VRF : v1
```

```
BGP Summary
 Local AS               : 100          BGP Router Identifier  : 9.0.0.1
 Peers                  : 1            Log Neighbor Changes   : No
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60

Address-family : IPv4 Unicast
-----------------------------
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
*4.4.4.4         11        26      24      00h:20m:26s  Established Up
 9.0.0.2         200       25      23      00h:17m:50s  Established Up

Address-family : IPv6 Unicast
-----------------------------
 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
*3001::3002      11        3       3       00h:00m:14s  Established Up
 9000::2         200       25      23      00h:17m:50s  Established Up
```

Showing BGP summary information for a specific VRF for IPv4 unicast network:

```
switch(config-bgp)# show bgp ipv4 unicast vrf v1 summary
Codes: * Dynamic Neighbor
VRF : v1
BGP Summary
 Local AS               : 100          BGP Router Identifier  : 9.0.0.1
 Peers                  : 1            Log Neighbor Changes   : No
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60

 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 9.0.0.2         200       25      23      00h:17m:50s  Established Up
*10.1.1.5        11        26      24      00h:20m:26s  Established Up
```

Showing BGP summary information for L2VPN EVPN:

```
switch(config-bgp)# do show bgp l2vpn evpn summary
Codes: * Dynamic Neighbor
VRF : default
BGP Summary
 Local AS               : 100          BGP Router Identifier  : 9.0.0.1
 Peers                  : 1            Log Neighbor Changes   : No
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60

 Neighbor        Remote-AS MsgRcvd MsgSent Up/Down Time State       AdminStatus
 10.0.0.2        200       25      23      00h:17m:50s  Established Up
 10.1.1.6        11        26      24      00h:20m:26s  Established Up
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp l2vpn evpn vni route-type

`show bgp l2vpn evpn vni <VNI-Value> route-type <ROUTE-TYPE-Value>`

Description

Shows the BGP L2VPN information for the particular EVPN VNI and routes type.

Parameter	Description
<VNI-Value>	Specifies the VNI.
<ROUTE-TYPE-Value>	Specifies the routes filtered by NLRI route type.

Examples

Showing BGP L2VPN information for the particular EVPN VNI and route type:

```
switch# show bgp l2vpn evpn vni 30000 route-type 5
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 5 prefix: [5]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]

VRF : default
Router-ID not configured

     Network                                                   Nexthop
Metric LocPrf Weight Path
----------------------------------------------------------------------------------
----------------------
Route Distinguisher: 1:100              (L3VNI 10000)
*>i [5]:[0]:[0]:[24]:[32.32.32.0]                              3.3.3.3         0
   100    0      ?
*>  [5]:[0]:[0]:[24]:[52.52.52.0]                              1.1.1.1         0
   100    0      ?
*>i [5]:[0]:[0]:[64]:[aaa::]                                   3.3.3.3         0
   100    0      ?

Total number of entries 3
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show bgp l2vpn evpn vtep

`show bgp l2vpn evpn vtep <IP-address>`

Description

Shows the BGP L2VPN information for the particular EVPN VTEP IP address.

Parameter	Description
<IP-address>	Specifies the VTEP IP address.

Examples

Showing BGP L2VPN information for the particular EVPN VTEP IP:

```
switch# show bgp l2vpn evpn vtep 1.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete

EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]
EVPN Route-Type 5 prefix: [5]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]
VRF : default
Local Router-ID 2.2.2.2

     Network                                               Nexthop         Metric
   LocPrf    Weight   Path
----------------------------------------------------------------------------------
--------------------------
Route Distinguisher: 1.1.1.1:2            (L2VNI 2)
*>i [2]:[0]:[0]:[00:00:00:00:00:33]:[10.1.1.10]            1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:00:00:00:00:33]:[1000::10]             1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:50:56:96:15:1c]:[10.1.1.1]             1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:50:56:96:15:1c]:[]                     1.1.1.1         0
   100        0       ?
*>i [3]:[0]:[1.1.1.1]                                      1.1.1.1         0
   100        0       ?

Route Distinguisher: 1.1.1.1:2            (L3VNI 10000)
*>i [2]:[0]:[0]:[00:00:00:00:00:33]:[10.1.1.10]            1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:00:00:00:00:33]:[1000::10]             1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:50:56:96:15:1c]:[10.1.1.1]             1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:50:56:96:15:1c]:[]                     1.1.1.1         0
```

```
   100        0       ?

Route Distinguisher: 1:100                (L3VNI 10000)
*>i [5]:[0]:[0]:[24]:[10.1.1.0]                            1.1.1.1         0
   100        0       ?
*>i [5]:[0]:[0]:[64]:[1000::]                              1.1.1.1         0
   100        0       ?
Total number of entries 11
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show bgp l2vpn evpn vtep route-type

`show bgp l2vpn evpn vtep <IP-address> route-type <ROUTE-TYPE-Value>`

Description

Shows the BGP L2VPN information for the particular EVPN VTEP IP address and routes type.

Parameter	Description
<IP-address>	Specifies the VTEP IP address.
<ROUTE-TYPE-Value>	Specifies the routes filtered by NLRI route type.

Examples

Showing BGP L2VPN information for the particular EVPN VTEP and route type:

```
switch# show bgp l2vpn evpn vtep 1.1.1.1 route-type 5
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete
EVPN Route-Type 5 prefix: [5]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]

VRF : default
Router-ID not configured

     Network                                                       Nexthop
```

```
Metric LocPrf Weight Path
----------------------------------------------------------------------------------
----------------------
Route Distinguisher: 1:100              (L3VNI 10000)
*>i [5]:[0]:[0]:[24]:[32.32.32.0]                              1.1.1.1         0
   100    0      ?
*>  [5]:[0]:[0]:[24]:[52.52.52.0]                              1.1.1.1         0
   100    0      ?
*>i [5]:[0]:[0]:[64]:[aaa::]                                   1.1.1.1         0
   100    0      ?

Total number of entries 3
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show bgp l2vpn evpn vtep vni

`show bgp l2vpn evpn vtep <IP-address> vni <VNI-Value>`

Description

Shows the BGP L2VPN information for the particular EVPN VTEP IP address and VNI.

Parameter	Description
<IP-address>	Specifies the VTEP IP address.
<VNI-Value>	Specifies the VNI.

Examples

Showing BGP L2VPN information for the particular EVPN VTEP IP and VNI:

```
switch# show bgp l2vpn evpn vtep 1.1.1.1 vni 10000
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete

EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]
EVPN Route-Type 5 prefix: [5]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]
VRF : default
Local Router-ID 2.2.2.2

     Network                                               Nexthop         Metric
   LocPrf    Weight   Path
----------------------------------------------------------------------------------
--------------------------
Route Distinguisher: 1.1.1.1:2            (L3VNI 10000)
*>i [2]:[0]:[0]:[00:00:00:00:00:33]:[10.1.1.10]            1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:00:00:00:00:33]:[1000::10]             1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:50:56:96:15:1c]:[10.1.1.1]             1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:50:56:96:15:1c]:[]                     1.1.1.1         0
   100        0       ?

Route Distinguisher: 1:100                (L3VNI 10000)
*>i [5]:[0]:[0]:[24]:[10.1.1.0]                            1.1.1.1         0
   100        0       ?
*>i [5]:[0]:[0]:[64]:[1000::]                              1.1.1.1         0
   100        0       ?
Total number of entries 6
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show bgp l2vpn evpn vtep vni route-type

`show bgp l2vpn evpn vtep <VTEP-ID> vni <VNI-Value> route-type <ROUTE-TYPE-Value>`

Description

Shows the BGP L2VPN information for the particular EVPN VTEP, VNI, and router type.

Parameter	Description
<VTEP-ID>	Specifies the VTEP.

Parameter	Description
<VNI-Value>	Specifies the VNI.
<ROUTE-TYPE-Value>	Specifies the router type.

Examples

Showing BGP L2VPN information for the particular EVPN VTEP, route type, and VNI:

```
switch# show bgp l2vpn evpn vtep 1.1.1.1 vni 10000 route-type 2
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed
Origin codes: i - IGP, e - EGP, ? - incomplete

EVPN Route-Type 2 prefix: [2]:[ESI]:[EthTag]:[MAC]:[OrigIP]
EVPN Route-Type 3 prefix: [3]:[EthTag]:[OrigIP]
EVPN Route-Type 5 prefix: [5]:[ESI]:[EthTag]:[IPAddrLen]:[IPAddr]
VRF : default
Local Router-ID 2.2.2.2

     Network                                               Nexthop         Metric
   LocPrf    Weight   Path
----------------------------------------------------------------------------------
--------------------------
Route Distinguisher: 1.1.1.1:2            (L3VNI 10000)
*>i [2]:[0]:[0]:[00:50:56:96:7d:03]:[10.1.1.1]             1.1.1.1         0
   100        0       ?
*>i [2]:[0]:[0]:[00:50:56:96:7d:03]:[]                     1.1.1.1         0
   100        0       ?

Total number of entries 3
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config bgp

```
show running-config bgp [vsx-peer]
```

Description

This command shows all configured BGP commands.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

EVPN only applies to 8100, 8325, 8360, 9300, 6300 and 6400 series switches.

```
switch# show running-config bgp
router bgp 65534.65535
    bgp asnotation dotted
    network 2.2.2.0/24
    neighbor 1.1.1.2 remote-as 65533.65535
    address-family ipv4 unicast
      neighbor 1.1.1.2 activate
      neighbor 1.1.1.2 route-map A out
      vrf v1
    address-family l2vpn evpn
      neighbor 1.1.1.2 activate
      neighbor 1.1.1.2 send-community extended
    exit-address-family
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

timers bgp

```
timers bgp <KEEPALIVE> <HOLDTIME>
no timers bgp <KEEPALIVE> <HOLDTIME>
```

Description

The command adjusts BGP network timers.

The **no** form of this command resets the BGP timers to defaults of 60 seconds for the keepalive timer and 180 seconds for the holdtime timer.

Parameter	Description
<KEEPALIVE>	Sets the value for keepalive timer. Default: 60 seconds. Range: 0-65535.
<HOLDTIME>	Sets the value for holdtime timer. Default: 180 seconds. Range: 0-65535.

Usage

- The keepalive timer is the number of seconds a BGP peer waits for a keep-alive message from a BGP peer before deciding the connection is down.

The holdtime timer is the number of seconds a BGP peer waits after not receiving a keepalive, update, or notification message before declaring that a connection with BGP peer is down.

- When a session is started, BGP negotiates holdtime with the neighbor, and selects the smaller value. The keepalive timer is then set based on the negotiated holdtime and the configured keepalive time.

Examples

```
switch(config-bgp)# timers bgp 100 150
switch(config-bgp)# no timers bgp
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-bgp	Administrators or local user group members with execution rights for this command.

vrf

```
vrf <VRF-NAME>
no vrf <VRF-NAME>
```

Description

Creates a VRF instance named <*VRF-NAME*> and then enters its context. Use **default** for <*VRF-NAME*> to enter the default VRF configure context.

Except for the default VRF, the **no** form of the command deletes the named VRF instance and any IP configuration for interfaces or SVI linked to default VRF. The default VRF cannot be deleted and a warning is given if attempted. To erase the Route-Distinguisher and Route-Targets, enter the default VRF context and delete them manually one by one.

Parameter	Description
<VRF-NAME>	Specifies the VRF name. Range: Up to 32 alphanumeric characters. The **mgmt** VRF cannot be used.

Examples

Creating the VRF named **cust_A** and then entering its context:

```
switch(config)# vrf cust_A
```

Entering the **default** VRF context:

```
switch(config)# vrf default
```

Deleting the VRF named **test**:

```
switch(config)# no vrf test
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.09	Added default VRF information.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

BIDIR-PIM commands

ip pim-bidir

```
ip pim-bidir [enable | disable]
```

Description

Enables or disables PIM-Bidir in the designated interface. This command works in the interface context, including loopback. The IP address must be configured on the interface to enable BIDIR-PIM.

Parameter	Description
`[enable]`	Enables PIM Bidirectional on the interface.
`[disable]`	Disables PIM Bidirectional on the interface.

Example

Enabling PIM-Bidir:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip address 40.0.0.4/24
switch(config-if-vlan)# ip pim-bidir enable
```

Disabling PIM-Bidir:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip address 40.0.0.4/24
switch(config-if-vlan)# ip pim-bidir disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip pim-bidir hello-delay

```
ip pim-bidir hello-delay <DELAY-VALUE>
no ip pim-bidir hello-delay <DELAY-VALUE>
```

Description

Changes the maximum time, in seconds, before the router transmits the initial PIM hello message on the current interface. The **no** form of this command removes the currently configured value and sets it to default. The default value is 5.

Parameter	Description
<DELAY-VALUE>	Configures the given value as the hello interval. Range: <0-5>.

Usage

In cases where a new L3 interface activates with connections to multiple routers, if all of the connected routers sent hello packets at the same time, the receiving router could momentarily become overloaded. This value randomizes the transmission delay to a time between 0 and the hello delay setting. Using 0 means no delay. After the router sends the initial hello packet to a newly detected L3 interface, it sends subsequent hello packets according to the current Hello Interval setting.

Example

Changing the maximum time before the router transmits the initial PIM hello message on the current interface to 4 seconds:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-bidir hello-delay 4
```

Removing the maximum time before the router transmits the initial PIM hello message on the current interface from 4 seconds and reverting to the default:

Disabling hello-delay:

```
switch(config)# interface vlan40
switch(config-if-vlan)# no ip pim-bidir hello-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip pim-bidir lan-prune-delay

```
ip pim-bidir lan-prune-delay
no ip pim-bidir lan-prune-delay
```

Description

Enables the LAN prune delay option on the current interface. The **no** form of this command disables the LAN prune delay option.

Usage

With LAN prune delay enabled, the router informs the downstream neighbors how long it waits before pruning a flow after receiving a prune request. Other downstream routers on the same subnet must send a join to override the prune before the LAN prune delay time for the flow to continue. This prompts any downstream neighbors with multicast receivers that continue to belong to the flow to reply with a join. If no joins are received after the LAN prune delay and override-interval period, the router prunes the flow. The propagation-delay and override-interval settings determine the LAN prune delay setting. It is enabled by default.

Example

Enabling the LAN prune delay option:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-bidir lan-prune-delay
```

Disabling the LAN prune delay option:

```
switch(config)# interface vlan40
switch(config-if-vlan)# no ip pim-bidir lan-prune-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip pim-bidir override-interval

```
ip pim-bidir override-interval <INTERVAL-VALUE>
no ip pim-bidir override-interval <INTERVAL-VALUE>
```

Description

Configures the override interval that gets inserted into the Override Interval field of a LAN prune delay option. The no form of this command removes the currently configured value and sets it to the default. The default value is 2500 milliseconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies override interval value. Range: 500-6000. Default: 2500.

Example

Configuring the override interval value to 4000:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-bidir override-interval 4000
```

Removing the override interval value and setting to default:

```
switch(config)# interface vlan40
switch(config-if-vlan)# no ip pim-bidir override-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip pim-bidir propagation-delay

```
ip pim-bidir propagation-delay <DELAY-VALUE>
no ip pim-bidir propagation-delay <DELAY-VALUE>
```

Description

Configures the propagation delay that gets inserted into the propagation delay field of a LAN prune delay option. The **no** form of this command removes any configuration and resets to the default. Default: 500 milliseconds.

Parameter	Description
<DELAY-VALUE>	Specifies the propagation delay in milliseconds. Range: 250-2000. Default: 500.

Example

Configuring the propagation delay to to 400 milliseconds:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-bidir propagation-delay 400
```

Removing the propagation delay and setting to default:

```
switch(config)# interface vlan40
switch(config-if-vlan)# no ip pim-bidir propagation-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

no ip pim-bidir

`no ip pim-bidir`

Description

Removes all PIM-Bidir configurations for the interface.

Example

Removing PIM-Bidir configurations for the interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# no ip pim-bidir
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim dfe

`show ip pim dfe [vrf <VRF-NAME> | all-vrfs]`

Description

Displays the Designated Forwarder information for a given interface and RP address in the topology. This prints the winner address along with winner metric details to reach RPA and its uptime details for a given VRF. If a VRF is not specified, the default is displayed.

Parameter	Description
<VRF-NAME>	Specifies the VRF.
[all-vrfs]	Specifies all VRFs.

Example

Displaying the Designated Forwarder information for the default VRF:

```
switch# show ip pim dfe
PIM BIDIR DFE Information

VRF                           : default
Total number of DFE entries   : 2

Interface         RPA               DF Winner          Metric            Uptime
(HH:MM:SS)
vlan10            1.1.1.1           10.1.1.3           100               00:33:15
vlan30            1.1.1.1           30.1.1.1           0                 00:33:16
```

Displaying the Designated Forwarder information for VRF red:

```
switch# show ip pim dfe vrf red
PIM BIDIR DFE Information

VRF                           : red
Total number of DFE entries   : 1

Interface         RPA               DF Winner          Metric            Uptime
```

```
(HH:MM:SS)
vlan50            5.5.5.5          50.1.1.5         200              00:34:42
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim dfe

`show ip pim dfe <INTERFACE-NAME> <RP-ADDRESS>`

Description

Displays the Designated Forwarder information for all interfaces of an RP address in the topology. This prints the winner address along with winner metric details to reach RPA and its uptime details for a given VRF. If a VRF is not specified, the default is displayed.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface.
<RP-ADDRESS>	Specifies the RP address.

Example

Displaying the Designated Forwarder information for 1.1.1.1:

```
switch# show ip pim dfe vlan10 1.1.1.1
PIM BIDIR DFE Information

VRF                            : default

Interface         RPA              DF Winner        Metric           Uptime
(HH:MM:SS)
vlan10            1.1.1.1          10.1.1.3         100              00:33:15
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config pim

`show running-config pim`

Description

Displays the current running configuration in the router pim context.

Example

Displaying the current running configuration in the router pim context:

```
switch# show running-config pim
router pim
       enable
       rp-address 10.0.0.4
       rp-candidate source-ip-interface loopback1 group-prefix 239.1.1.1/32
       multicast-route-limit 1024
       active-active
       anycast-rp source-directly-connected
router pim vrf green
       enable
       rp-address 30.0.0.4
       rp candidate source-ip-interface loopback1 group-prefix 224.0.0.0/4
       multicast-route-limit 1024
       active-active
       anycast-rp source-directly-connected
interface loopback11
       ip pim-bidir enable
interface loopback44
       ip pim-bidir enable
interface vlan30
       ip pim-bidir enable
interface vlan500
       ip pim-bidir enable
```

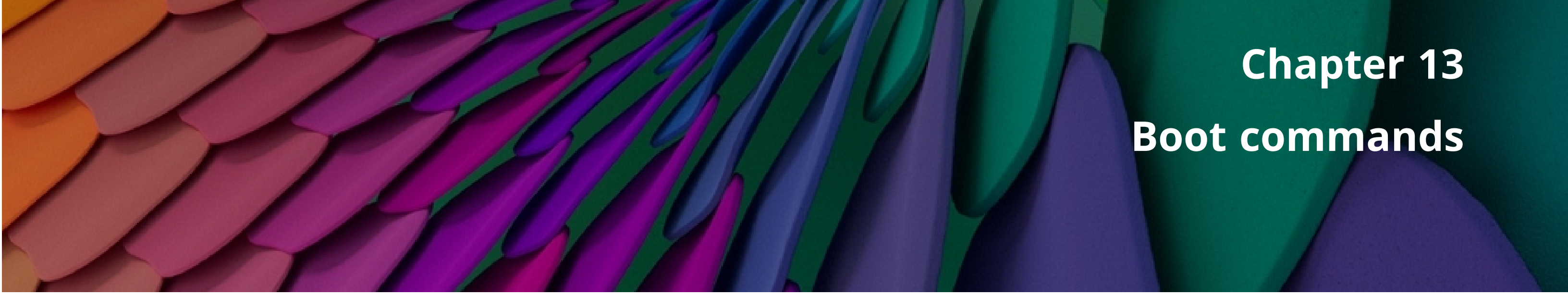
For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	BIDIR PIM introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 13
Boot commands

boot fabric-module

```
boot fabric-module <SLOT-ID>
```

Description

Reboots the specified fabric module.

Parameter	Description
<SLOT-ID>	Specifies the member and slot of the module in the format **member/slot**. For example, to specify the module in member 1 slot 3, enter **1/3**.

Usage

The **boot fabric-module** command reboots the specified fabric module. Traffic performance is affected while the module is down.

If the specified module is the only fabric module in an up state, rebooting that module stops traffic switching between line modules and the line modules power down. The line modules power up when one fabric module returns to an up state.

This command is valid for fabric modules only.

Examples

Rebooting the fabric module in slot **1/3** when auto-confirm is not enabled:

```
switch# boot fabric-module 1/3
This command will reboot the specified fabric module.  Traffic performance may
be affected while the module is down.  Rebooting the last fabric module will
stop traffic switching between line modules.
Do you want to continue (y/n)? y

switch#
```

Rebooting the fabric module in slot **1/1** when auto-confirm is enabled:

```
switch# boot fabric-module 1/3
This command will reboot the specified fabric module.  Traffic performance may
be affected while the module is down.  Rebooting the last fabric module will
stop traffic switching between line modules.
Do you want to continue (y/n) y (auto-confirm)

switch#
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

boot line-module

```
boot line-module <SLOT-ID>
```

Description

Reboots the specified line module.

Parameter	Description
<SLOT-ID>	Specifies the member and slot of the module in the format **member/slot**. For example, to specify the module in member 1 slot 3, enter **1/3**.

Usage

This command is supported on switches that have multiple line modules.

Reboots the specified line module. Any traffic for the switch passing through the affected module (SSH, TELNET, and SNMP) is interrupted. It can take up to 2 minutes to reboot the module. During that time, you can monitor progress by viewing the event log.

This command is valid for line modules only.

Examples

Reloading the module in slot 1/1:

```
switch# boot line-module 1/1
This command will reboot the specified line module and interfaces on this
module will not send or receive packets while the module is down. Any
traffic passing through the line module will be interrupted. Management
sessions connected through the line module will be affected. It might take
up to 2 minutes to complete rebooting the module. During that time, you can
monitor progress by viewing the event log.
Do you want to continue (y/n)? y
switch#
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

boot management-module

```
boot management-module {active | standby | <SLOT-ID>}
```

Description

Reboots the specified management module. Choose the management module to reboot by role (active or standby) or by slot number.

Parameter	Description
active	Selects the active management module.
standby	Selects the standby management module.
<SLOT-ID>	Specifies the member and slot of the management module in the format **member/slot**. For example, to specify the module in member 1 slot 5, enter **1/5**.

Usage

This command is supported on switches that have multiple management modules.

This command reboots a single management module in a chassis. Choose the management module to reboot by role (active or standby) or by slot number.

You can use the **show images** command to show information about the primary and secondary system images.

If you reboot the active management module and the standby management module is available, the active management module reboots and the standby management module becomes the active management module.

If you reboot the active management module and the standby management module is not available, you are warned, you are prompted to save the configuration, and you are prompted to confirm the operation.

If you reboot the standby management module, the standby management module reboots and remains the standby management module.

If you attempt to reboot a management module that is not available, the **boot** command is aborted.

Saving the configuration is not required. However, if you attempt to save the configuration and there is an error during the save operation, the **boot** command is aborted.

Hewlett Packard Enterprise recommends that you use the **boot management-module** command instead of pressing the module reset button to reboot a management module because if you are rebooting the only available management module, the **boot management-module** command enables you to save the configuration, cancel the reboot, or both.

Examples

Rebooting the active management module when the standby management module is available:

```
switch# boot management-module active
The management-module in slot 1/5 is going down for reboot now.
```

Rebooting the active management module when the standby management module is not available:

```
switch# boot management-module 1/5
The management module in slot 1/5 is currently active and no
standby management module was found.
This will reboot the entire switch.

Do you want to save the current configuration (y/n)? n

This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? y
The system is going down for reboot.
```

command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

boot management-module (recovery console)

`boot management-module {local|remote}`

Description

Reboots the specified management module by specified location (local or remote).

Parameter	Description
<local>	Reboots the local management module.
<remote>	Reboots the remote management module.

Usage

This command is supported on switches that have multiple management modules.

This command reboots a single management module in a chassis. Choose the management module to reboot by role (active or standby) or by slot number.

You can use the **show images** command to show information about the primary and secondary system images.

If you reboot the active management module and the standby management module is available, the active management module reboots and the standby management module becomes the active management module.

If you reboot the active management module and the standby management module is not available, you are warned, you are prompted to save the configuration, and you are prompted to confirm the operation.

If you reboot the standby management module, the standby management module reboots and remains the standby management module.

If you attempt to reboot a management module that is not available, the **boot** command is aborted.

Saving the configuration is not required. However, if you attempt to save the configuration and there is an error during the save operation, the **boot** command is aborted.

Hewlett Packard Enterprise recommends that you use the **boot management-module** command instead of pressing the module reset button to reboot a management module because if you are rebooting the only available management module, the **boot management-module** command enables you to save the configuration, cancel the reboot, or both.

Examples

Booting a remote management module:

```
switch# boot management-module remote
There is no other management module installed.
Aborting.
switch#
```

command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

boot set-default

```
boot set-default {primary | secondary}
```

Description

Sets the default operating system image to use when the system is booted.

Parameter	Description
`primary`	Selects the primary network operating system image.
`secondary`	Selects the secondary network operating system image.

Example

Selecting the primary image as the default boot image:

```
switch# boot set-default primary
Default boot image set to primary.
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

boot system

```
boot system [primary | secondary | serviceos]
```

Description

Reboots all modules on the switch. By default, the configured default operating system image is used. Optional parameters enable you to specify which system image to use for the reboot operation and for future reboot operations.

Parameter	Description
`primary`	Selects the primary operating system image for this reboot and sets the configured default operating system image to **primary** for future reboots.
secondary	Selects the secondary operating system image for this reboot and sets the configured default operating system image to **secondary** for future reboots.
`serviceos`	Selects the service operating system for this reboot. Does not change the configured default operating system image. The service operating system acts as a standalone bootloader and recovery OS for switches running the AOS-CX operating system and is used in rare cases when troubleshooting a switch.

Usage

This command reboots the entire system. If you do not select one of the optional parameters, the system reboots from the configured default boot image.

You can use the **show images** command to show information about the primary and secondary system images.

Choosing one of the optional parameters affects the setting for the default boot image:

- If you select the **primary** or **secondary** optional parameter, that image becomes the configured default boot image for future system reboots. The command fails if the switch is not able to set the operating system image to the image you selected.

You can use the **boot set-default** command to change the configured default operating system image.

- If you select **serviceos** as the optional parameter, the configured default boot image remains the same, and the system reboots all management modules with the service operating system.

If the configuration of the switch has changed since the last reboot, when you execute the **boot system** command you are prompted to save the configuration and you are prompted to confirm the reboot operation.

Saving the configuration is not required. However, if you attempt to save the configuration and there is an error during the save operation, the **boot system** command is aborted.

Examples

Rebooting the system from the configured default operating system image:

```
switch# boot system
Do you want to save the current configuration (y/n)? y
The running configuration was saved to the startup configuration.
```

```
This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? y
The system is going down for reboot.
The system is going down for reboot.
```

Rebooting the system from the secondary operating system image, setting the secondary operating system image as the configured default boot image:

```
switch# boot system secondary
Default boot image set to secondary.

Do you want to save the current configuration (y/n)? n

This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? y
The system is going down for reboot.
```

Canceling a system reboot:

```
switch# boot system

Do you want to save the current configuration (y/n)? n

This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? n
Reboot aborted.
switch#
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show boot-history

```
show boot-history [all|{vsf member <1-10>}]
```

Description

Shows boot history information. When no parameters are specified, shows the most recent information about the current boot operation, and the three previous boot operations for the switch. When the **all** parameter is specified, the output of this command shows the boot information for the active management module.

For switches that support line modules (such as 6400 switch series) including the **all** parameter displays information for the active management module and all available line modules.

To view boot-history on a standby, the command must be sent on the conductor console.

Parameter	Description
`all`	Optional. Shows boot information for the active management module. For switches that support line modules, including this parameter displays information for and all available line modules.
`vsf member <1-10>`	Optional. Display boot history for the specified VSF member

Usage

This command displays the boot-index, boot-ID, and up time in seconds for the current boot. If there is a previous boot, it displays boot-index, boot-ID, reboot time (based on the time zone configured in the system) and reboot reasons. Previous boot information is displayed in reverse chronological order.

The output of this command includes the following information:

Parameter	Description
`Index`	The position of the boot in the history file. Range: 0 to 3.
`Boot ID`	A unique ID for the boot . A system-generated 128-bit string.
`Current Boot, up for <time>`	For the current boot, the **show boot-history** command shows the number of seconds the module has been running on the current software.
`<Timestamp>: boot reason`	For previous boot operations, the **show boot-history** command shows the time at which the operation occurred and the reason for the boot. The reason for the boot is one of the following values: ■ ***<DAEMON-NAME>* crash**: The daemon identified by *<DAEMON-NAME>* caused the module to boot. ■ **Kernel crash**: The operating system software associated with the module caused the module to boot. ■ **Uncontrolled reboot**: The reason for the reboot is not known. ■ **Reboot requested through database**: The reboot occurred because of a request made through the CLI or other API. For details, see , show boot-history

Table 1: *Description of reboots handled through the database*

Boot History String	Description
Reboot requested by user	A user requested a switch reboot through the CLI or web UI.
Reset button pressed	The switch detected a short-press of the reset button
Backplane fault	A backplane fault occurred.
Configuration change	A configuration change resulted in a reboot.
Configuration version migration	A configuration version migration occurred which required a reboot.
Console error	The console failed to start.
Fabric fault	A fabric fault occurred.
All line modules faulted	A zero line card condition occurred.
Redundancy switchover requested	A user requested a redundancy switchover.
Redundant Management communication timeout	The standby management module has taken over from an unresponsive active management module.
Redundant Management election timeout	A failure to elect a standby management module in the allotted time.
Critical service fault (error)	A daemon critical to switch operation has stopped functioning. An extra error string may be present to describe the error in detail.
VSF autojoin renumber	Reset triggered by VSF autojoin.
VSF member renumbered	A user requested a renumber of a VSF member.
VSF switchover requested	A user requested a VSF switchover.
VSX software update	Reset triggered by a VSX software update.
Chassis critical temperature	Chassis operating temperature exceeded.
Chassis low critical temperature	Chassis temperature below the minimum operating threshold.
Chassis insufficient fans	Insufficient fans to cool the chassis.
Chassis unsupported PSUs/fans	Unsupported or misconfigured PSUs or system fans.
Management module critical temperature	Management module operating temperature exceeded.
ISSU SMM update	Standby management module reboot triggered by an In-Service Software Upgrade (ISSU).
ISSU switchover	Redundancy switchover triggered by an In-Service Software Upgrade.

Boot History String	Description
ISSU aborted	Standby management module reset triggered by failure during an In-Service Software Upgrade.
Rollback timer expired	Reset triggered by the ISSU rollback timer expiring.

Examples

Showing the boot history of the active management module:

```
switch# show boot-history
Management module
=================

Index : 2
Boot ID : c34a2c2499004a02bbeeff4992e1fdbd
Current Boot, up for 1 days 13 hrs 13 mins 27 secs

Index : 1
Boot ID : bfba9bc486304e57904ac717a0ccbdcd
02 Sep 23 02:55:33 : CPU request reset with 0x20201, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:55:33 : Switch boot count is 2

Index : 0
Boot ID : a88a71b7ca9a4574af7e3b811ddfdc7e
02 Sep 23 02:49:26 : Reboot requested by user, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:50:02 : Switch boot count is 1

Index : 3
Boot ID : f00ba10c8c44457f83fee303d014a89a
25 Aug 23 10:27:42 :  Power on reset with 0x1, Version: FL.10.14.0000-1465-
g9df95249d06b0~dirty
25 Aug 23 10:28:18 :  Switch boot count is 3
25 Aug 23 10:29:02 :  Primary overtemperature fault detected with 0x2 in PSU 1/1
```

(For 6400 Switch series) Showing the boot history of the active management module and all line modules:

```
switch#
Management module
=================

Index : 3
Boot ID : f1bf071bdd04492bbf8439c6e479d612
Current Boot, up for 22 hrs 12 mins 22 secs

Index : 2
Boot ID : edfa2d6598d24e989668306c4a56a06d
07 Aug 18 16:28:01 : Reboot requested through database

Index : 1
Boot ID : 0bda8d0361df4a7e8e3acdc1dba5caad
07 Aug 18 14:08:46 : Reboot requested through database

Index : 0
Boot ID : 23da2b0e26d048d7b3f4b6721b69c110
```

```
07 Aug 18 13:00:46 : Reboot requested through database

Line module 1/1
=================
Index : 3
10 Aug 17 12:45:46 : dune_agent crashed
...

Management module
=================

Index : 3
Boot ID : f1bf071bdd04492bbf8439c6e479d612
Current Boot, up for 22 hrs 12 mins 22 secs

Index : 2
Boot ID : edfa2d6598d24e989668306c4a56a06d
07 Aug 18 16:28:01 : Reboot requested through database

Index : 1
Boot ID : 0bda8d0361df4a7e8e3acdc1dba5caad
07 Aug 18 14:08:46 : Reboot requested through database

Index : 0
Boot ID : 23da2b0e26d048d7b3f4b6721b69c110
07 Aug 18 13:00:46 : Reboot requested through database

Line module 1/1
=================
Index : 3
10 Aug 17 12:45:46 : dune_agent crashed
...
```

In the event of a reset triggered by a power supply unit (PSU), or a PSU input fault, the output of this command also displays information about why the PSU initiated a reboot. The following example displays the boot history of a switch with a reboot initiated by a PSU.

```
switch# show boot-history

Management module
=================
Index : 2
Boot ID : a61ad00d10864c748bc7893a5d4af2e4
15 Dec 23 19:02:02 : Power on reset with 0x1, Version: FL.10.13.1000AF

15 Dec 23 19:02:02 : Switch boot count is 0
15 Dec 23 19:02:17 : PSU 1/1: Fault detected

Index : 1
Boot ID : 30d831bbfdfa425baf50a629ee01b185
15 Dec 23 19:01:58 : Power on reset with 0x1, Version: FL.10.13.1000AF
15 Dec 23 19:01:58 : Switch boot count is 0
```

The following example displays the boot history for the VSF member **2**.

```
switch# show boot-history vsf member 2

Member-2
=========
Index : 0
Boot ID : df99026c194a44f1944a3e7685fb4d90
Current Boot, up for 3 hrs 31 mins 39 secs

Index : 3
Boot ID : 7bf4104903fe4ad1ba4bce40e8099c76
10 Aug 17 10:02:24 : Reboot requested through database
10 Aug 17 10:02:13 : Switch boot count is 2
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.13.1000	The output of this command is enhanced to display additional information about the reason for the reboot, if available.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

Chapter 14

Cable diagnostic commands

diag cable-diagnostic

```
diag cable-diagnostic
   test <IF-NAME>
   show <IF-NAME>
   clear <IF-NAME>
```

Description

Provides information about the cable health after running a diagnostic test on an interface.

If you run a new cable diagnostic command when a cable diagnostic is in progress for the interface, the new cable diagnostic command fails to execute. In such a scenario, an error message is displayed.

On executing a cable diagnostic test command, it automatically clears the old test results before the new test starts.

Parameter	Description
<IF-NAME>	Specifies the name of the interface.
`test` *<IF-NAME>*	Runs a cable diagnostic test on an interface.
`show` *<IF-NAME>*	Displays the diagnostic test result for an interface.
`clear` *<IF-NAME>*	Clears the cable diagnostic test results for an interface.

Examples

On the 6400 Switch Series, interface identification differs.

The following example displays running a cable diagnostic test on interface `1/3/1`:

```
switch# diag cable-diagnostic test 1/3/1
This command will cause a loss of link on the port under test and will take
several seconds to complete.
Continue (y/n)? y
```

The following example displays the error message on executing a cable diagnostic command while the current diagnostic test is in progress:

```
switch# diag cable-diagnostic test 1/3/1
A cable diagnostic test for interface 1/3/1 is already in progress.
```

The following example displays the error message when cable diagnostic test is requested for an unsupported port:

```
switch# diag cable-diagnostic test 1/3/1
Cable diagnostic is not supported on interface 1/3/1.
```

The following examples display the cable diagnostic test result for 1GbT interface:

```
switch# diag cable-diagnostic show 1/3/1
                          Cable        Impedance   Distance*   MDI
Interface        Pinout   Status       (Ohms)      (Meters)    Mode
--------------------------------------------------------------------
1/3/1            1-2      good         85-115       10 +/- 10  mdi
(1GbT)           3-6      good         85-115       10 +/- 10  mdi
                 4-5      good         85-115        5 +/- 10  mdi
                 7-8      good         85-115        3 +/- 10  mdi

* Full cable length for good cables or distance to fault for faulty cables.

Cable status legend (1GbT):

Cable        Impedance
Status       (Ohms)     Description
----------------------------------------------------------------
good         85-115     No cable faults found
open         >115       Open circuit detected
intra-short  <85        Short circuit within the same wire pair
inter-short  <85        Short circuit with another wire pair
high-imp     >115       Cable impedance higher than expected
low-imp      <85        Cable impedance lower than expected
unknown      --         Cable test inconclusive
```

The following examples display the cable diagnostic test result for 5G-SmartRate interface:

```
switch# diag cable-diagnostic show 1/1/20
                          Cable        Impedance   Distance*   MDI
Interface        Pinout   Status       (Ohms)      (Meters)    Mode
--------------------------------------------------------------------
1/1/20           1-2      good         85-115           --     mdi
(5G-SmartRate)   3-6      open         >300          4 +/- 5   mdi
                 4-5      open         >300          4 +/- 5   mdi
                 7-8      high-imp     >115          3 +/- 5   mdi

* Full cable length for good cables or distance to fault for faulty cables.

Cable status legend (5G-SmartRate):

Cable        Impedance
Status       (Ohms)     Description
----------------------------------------------------------------
good         85-115     No cable faults found
open         >300       Open circuit detected
intra-short  <30        Short circuit within the same wire pair
inter-short  <30        Short circuit with another wire pair
high-imp     >115       Cable impedance higher than expected
low-imp      <85        Cable impedance lower than expected
unknown      --         Cable test inconclusive
```

The following example displays the error message when you execute a cable diagnostic command while the current diagnostic test is in progress:

```
switch# diag cable-diagnostic show 1/3/1
A cable diagnostic test for interface 1/3/1 is currently in progress.
```

The following example displays the error message when cable diagnostic test result is not available:

```
switch# diag cable-diagnostic show 1/3/1
Cable diagnostic test results for interface 1/3/1 are not available.
```

The following example clears the cable diagnostic test results for the specified interface:

```
switch# diag cable-diagnostic clear 1/3/1
```

The following example displays the error message when you execute a cable diagnostic command while the current diagnostic test is in progress:

```
switch# diag cable-diagnostic clear 1/3/1
A cable diagnostic test for interface 1/3/1 is currently in progress.
```

Running a cable diagnostic test will result in a brief interruption in connectivity on all tested ports.

If a good cable is used on the SmartRate ports, the **Distance to Fault (Meters)** value is 0.

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

Chapter 15

Captive portal (RADIUS) commands

aaa authentication port-access captive-portal-profile

```
aaa authentication port-access captive-portal-profile <PROFILE-NAME>
no aaa authentication port-access captive-portal-profile <PROFILE-NAME>
```

Description

Creates the specified captive portal profile (if it does not yet exist) and then enters its context. For existing captive portal profiles, this command enters the context of the specified captive portal profile.

The **no** form of this command deletes the specified captive portal profile.

Parameter	Description
<PROFILE-NAME>	Specifies the captive portal profile name. From 2 to 64 characters.

Examples

Creating a captive portal profile named `employee` and entering its context for additional configuration:

```
switch(config)# aaa authentication port-access captive-portal-profile employee
switch(config-captive-portal)# url http://1.1.1.1/employee/captiveportal.php
switch(config-captive-portal)#
switch(config-captive-portal)# url-hash-key plaintext cjQrJ9#$erty
switch(config-captive-portal)#
switch(config-captive-portal)# exit
switch(config)#
```

Deleting the captive portal profile named `employee`:

```
switch(config)# no aaa authentication port-access captive-portal-profile employee
switch(config)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show port-access captive-portal-profile

`show port-access captive-portal-profile [name <PROFILE-NAME>]`

Description

Shows the configuration information for all captive portal profiles or a particular captive portal profile.

Parameter	Description
<PROFILE-NAME>	Specifies the captive portal profile name. From 2 to 64 characters.

Example

Showing IPv4 local captive portal profile configuration information:

```
switch# show port-access captive-portal-profile name employee

Captive Portal Profile Configuration

    Name                            : employee
    Type                            : local
    URL                             : http://1.1.1.1/employee/captiveportal.php
    URL Hash Key                    : SWNGWyMeYubHPDgVIirpEUwNK5Uf+r1vmhBIncQPw1Y=
```

Showing IPv6 local captive portal profile configuration information:

```
switch# show port-access captive-portal-profile name CP6

Captive Portal Profile Configuration

    Name                            : CP6
    Type                            : local
    URL                             : https://[2000::3]/guest/captive_portal.php
    URL Hash Key                    : SWNGWyMeYubHPDgVIirpEUwNK5Uf+r1vmhBIncQPw1Y=
```

Showing IPv6 DUR captive portal profile configuration information):

```
switch# show port-access captive-portal-profile name CP6_DUR_GUEST_ROLE

Captive Portal Profile Configuration

    Name                            : CP6_DUR_GUEST_ROLE
    Type                            : downloaded
    URL                             : https://[2030:1::40]/guest/captive_portal_2.php
```

Showing IPv6 RADIUS VSA captive portal profile configuration information:

```
switch# show port-access captive-portal-profile name RADIUS_2259748436

Captive Portal Profile Configuration

    Name                           : RADIUS_2259748436
    Type                           : radius
    URL                            : https://[2030:1::40]/guest/captive_portal_2.php
```

Showing all captive portal profile configuration information):

```
switch# show port-access captive-portal-profile

Captive Portal Profile Configuration

    Name                           : CP6
    Type                           : local
    URL                            : https://[2000::3]/guest/captive_portal.php
    URL Hash Key                   : SWNGWyMeYubHPDgVIirpEUwNK5Uf+r1vmhBIncQPw1Y=

    Name                           : CP6_DUR_GUEST_ROLE
    Type                           : downloaded
    URL                            : https://[2030:1::40]/guest/captive_portal_2.php

    Name                           : RADIUS_2259748436
    Type                           : radius
    URL                            : https://[2030:1::40]/guest/captive_portal_2.php
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

url

```
url <URL>
no url
```

Description

Within the captive portal context, defines the captive portal URL.

The **no** form of this command deletes the captive portal URL.

Parameter	Description
<URL>	Specifies the captive portal URL as an IPv4 or IPv6 address or a fully-qualified domain name. Up to 1024 characters.

Examples

Creating a captive portal profile named `employee` and then setting its IPv4 redirect URL:

```
switch(config)# aaa authentication port-access captive-portal-profile employee
switch(config-captive-portal)# url http://1.1.1.1/employee/captiveportal.php
switch(config-captive-portal)#
switch(config-captive-portal)# exit
switch(config)#
```

Entering the captive portal profile `employee` and then deleting its URL:

```
switch(config)# aaa authentication port-access captive-portal-profile employee
switch(config-captive-portal)# no url
switch(config-captive-portal)#
switch(config-captive-portal)# exit
switch(config)#
```

Creating a captive portal profile named `CP6` and then setting its IPv6 redirect URL:

```
switch(config)# aaa authentication port-access captive-portal-profile CP6
switch(config-captive-portal)# url https://[2000::3]/guest/captive_portal.php
switch(config-captive-portal)#
switch(config-captive-portal)# exit
switch(config)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-captive-portal`	Administrators or local user group members with execution rights for this command.

url-hash-key

```
url-hash-key [{plaintext | ciphertext} <HASH-KEY>]
no url-hash-key
```

Description

Within the captive portal context, defines the captive portal URL hash key.

When this command is entered without parameters, plaintext hash key prompting occurs upon pressing Enter. The entered hash key characters are masked with asterisks.

The **no** form of this command deletes the captive portal URL hash key.

Parameter	Description
`{plaintext | ciphertext}`	Selects the URL hash key type as either `plaintext` or `ciphertext`.
`<HASH-KEY>`	Specifies the captive portal URL hash key. Up to 128 characters.

Examples

Creating a captive portal profile named `employee` and then setting its URL and URL hash key:

```
switch(config)# aaa authentication port-access captive-portal-profile employee
switch(config-captive-portal)# url http://1.1.1.1/employee/captiveportal.php
switch(config-captive-portal)#
switch(config-captive-portal)# url-hash-key plaintext cjQrJ9#$erty
switch(config-captive-portal)#
```

Creating a captive portal profile named `guest` and then setting its URL and entering the URL hash key when prompted:

```
switch(config)# aaa authentication port-access captive-portal-profile guest
switch(config-captive-portal)# url http://1.1.1.1/guest/captiveportal.php
switch(config-captive-portal)#
switch(config-captive-portal)# url-hash-key
Enter the URL Hash-Key: ****
Re-Enter the URL Hash-Key: ****
switch(config-captive-portal)#
```

Entering the captive portal profile `employee` and then deleting its URL hash key:

```
switch(config)# aaa authentication port-access captive-portal-profile employee
switch(config-captive-portal)# no url-hash-key
switch(config-captive-portal)#
```

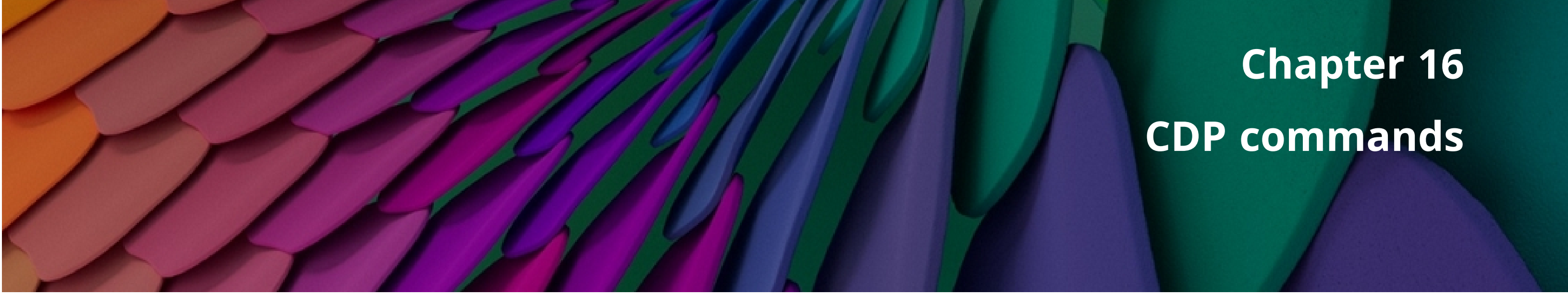
For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-captive-portal`	Administrators or local user group members with execution rights for this command.



Chapter 16

CDP commands

cdp

`cdp`

Description

Configures CDP support globally on all active interfaces or on a specific interface. By default, CDP is enabled on all active interfaces.

When CDP is enabled, the switch adds entries to its CDP Neighbors table for any CDP packets it receives from neighboring CDP devices.

When CDP is disabled, the CDP Neighbors table is cleared and the switch drops all inbound CDP packets without entering the data in the CDP Neighbors table.

The **no** form of this command disables CDP support globally on all active interfaces or on a specific interface.

Examples

Enabling CDP globally:

```
switch(config)# cdp
```

Disabling CDP globally:

```
switch(config)# no cdp
```

Enabling CDP on interface **1/1/1**:

```
switch(config)# interface 1/1/1s
switch(config-if)# cdp
```

Disabling CDP on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no cdp
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` `config-if`	Administrators or local user group members with execution rights for this command.

clear cdp counters

```
clear cdp counters
```

Description

Clears CDP counters.

Examples

Clearing CDP counters:

```
switch(config) clear cdp counters
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

clear cdp neighbor-info

```
clear cdp neighbor-info
```

Description

Clears CDP neighbor information.

Examples

Clearing CDP neighbor information:

```
switch(config) clear neighbor-info
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show cdp

`show cdp`

Description

Shows CDP information for all interfaces.

Examples

On the 6400 Switch Series, interface identification differs.

Showing CDP information:

```
switch(config)# show cdp
CDP Global Information
======================
CDP           : Enabled
CDP Mode      : Rx only
CDP Hold Time : 180 seconds

Port         CDP
--------  --------------
1/1/1          Enabled
1/1/2          Enabled
1/1/3          Enabled
1/1/4          Enabled
1/1/5          Enabled
1/1/6          Enabled
1/1/7          Enabled
1/1/8          Enabled
1/1/9          Enabled
1/1/10         Enabled
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show cdp neighbor-info

`show cdp neighbor-info <INTERFACE-ID>`

Description

Shows CDP information for all neighbors or for CDP information on a specific interface.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: **member/slot/port**.

Examples

On the 6400 Switch Series, interface identification differs.

Showing all CDP neighbor information:

```
switch(config)# show cdp neighbor-info
Total Neighbor Entries  : 1
Port        Device ID                 Platform                 Capability
---------------------------------------------------------------------------
1/1/1       Aruba-3810M-24G-1-slot... Aruba Sw                         S
```

Showing CDP information for interface **1/1/1**:

```
switch(config)# show cdp neighbor-info 1/1/1
Local Port           : 1/1/1
MAC                  : 70:10:6f:86:78:7f
Device ID            : Aruba-3810M-24G-1-slot(70106f-867800)
Address              : 127.0.0.1
Platform             : Aruba Sw
Duplex               : half
Version              : Revision KB.16.07.0002, ROM KB.16.01....
Capability           : switch
```

```
Native VLAN        : 1
Voice VLAN Support : No
Neighbor Port-ID   : 1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show cdp traffic

`show cdp traffic`

Description

Shows CDP statistics for each interface.

Examples

On the 6400 Switch Series, interface identification differs.

Showing CDP traffic statistics:

```
switch(config)# show cdp traffic
CDP Statistics
====================
Port        Transmitted Frames       Received Frames          Discarded Frames
--------------------------------------------------------------------------------
1/1/1          0                        4                        0
1/1/2          0                        0                        0
1/1/3          0                        2                        0
1/1/4          0                        0                        0
1/1/5          0                        0                        0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show cdp voice-vlan mode

`show cdp voice-vlan mode`

Description

Shows CDP voice-vlan and mode.

Examples

On the 6400 Switch Series, interface identification differs.

Showing CDP voice-vlan and mode:

```
switch(config)# show cdp voice-vlan mode
CDP voice VLAN mode
====================
Port        Voice VLAN        Mode
--------    -----------       ----------
1/1/1       N/A               Rx only
1/1/2       N/A               Rx only
1/1/3       N/A               Rx only
1/1/4       N/A               Rx only
1/1/5       N/A               Rx only
1/1/6       N/A               Rx only
1/1/7       N/A               Rx only
1/1/8       N/A               Rx only
1/1/9       N/A               Rx only
```

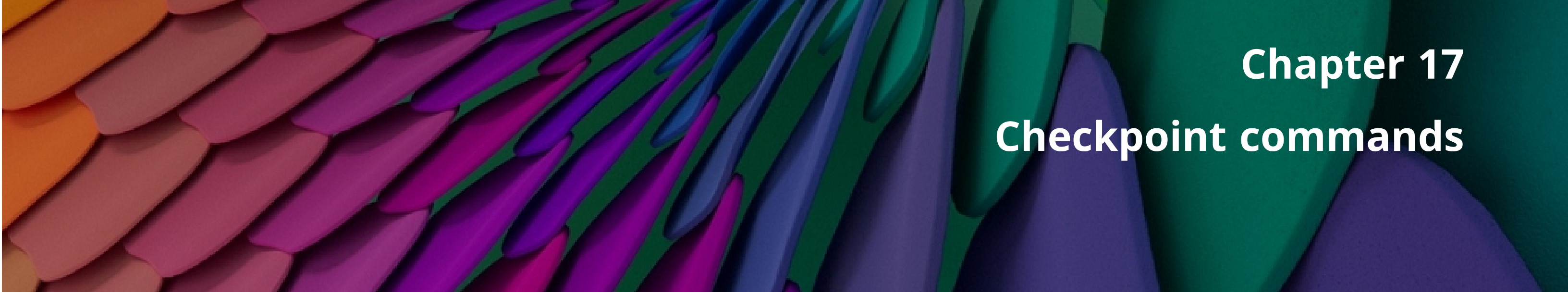
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 17
Checkpoint commands

checkpoint auto

`checkpoint auto <TIME-LAPSE-INTERVAL>`

Description

Starts auto checkpoint mode. In auto checkpoint mode, the switch temporarily saves the runtime configuration as a checkpoint only for the specified time lapse interval. Configuration changes must be saved before the interval expires, otherwise the runtime configuration is restored from the temporary checkpoint.

Parameter	Description
<TIME-LAPSE-INTERVAL>	Specifies the time lapse interval in minutes. Range: 1 to 60.

Usage

To save the runtime checkpoint permanently, run the **checkpoint auto confirm** command during the time lapse interval. The filename for the saved checkpoint is named **AUTO <YYYYMMDDHHSS>**. If the **checkpoint auto confirm** command is not entered during the specified time lapse interval, the previous runtime configuration is restored.

Examples

Confirming the auto checkpoint:

```
switch# checkpoint auto 20
Auto checkpoint mode expires in 20 minute(s)
switch# WARNING  Please "checkpoint auto confirm" within 2 minutes
switch# checkpoint auto confirm
checkpoint AUTO20170801011154 created
```

In this example, the runtime checkpoint was saved because the **checkpoint auto confirm** command was entered within the value set by the **time-lapse-interval** parameter, which was 20 minutes.

Not confirming the auto checkpoint:

```
switch# checkpoint auto 20
Auto checkpoint mode expires in 20 minute(s)
switch# WARNING  Please "checkpoint auto confirm" within 2 minutes
WARNING: Restoring configuration. Do NOT add any new configuration.
Restoration successful
```

In this example, the runtime checkpoint was reverted because the **checkpoint auto confirm** command was not entered within the value set by the **time-lapse-interval** parameter, which was 20 minutes.

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

checkpoint auto confirm

```
checkpoint auto confirm
```

Description

Signals to the switch to save the running configuration used during the auto checkpoint mode. This command also ends the auto checkpoint mode.

Usage

To save the runtime checkpoint permanently, run the **checkpoint auto confirm** command during the time lapse value set by the **checkpoint auto TIME-LAPSE-INTERVAL** command. The generated checkpoint name will be in the format **AUTO <YYYYMMDDHHSS>**. If the **checkpoint auto confirm** command is not entered during the specified time lapse interval, the previous runtime configuration is restored.

Examples

Confirming the auto checkpoint:

```
switch# checkpoint auto confirm
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

checkpoint diff

```
checkpoint diff {<CHECKPOINT-NAME1> | running-config | startup-config}
     {<CHECKPOINT-NAME2> | running-config | startup-config}
```

Description

Shows the difference in configuration between two configurations. Compare checkpoints, the running configuration, or the startup configuration.

Parameter	Description
`{<CHECKPOINT-NAME1> | running-config | startup-config}`	Selects either a checkpoint, the running configuration, or the startup configuration as the baseline.
`{<CHECKPOINT-NAME2> | running-config | startup-config}`	Selects either a checkpoint, the running configuration, or the startup configuration to compare.

Usability

The output of the **checkpoint diff** command has several symbols:

- The plus sign (+) at the beginning of a line indicates that the line exists in the comparison but not in the baseline.
- The minus sign (-) at the beginning of a line indicates that the line exists in the baseline but not in the comparison.

Examples

In the following example, the configurations of checkpoints **cp1** and **cp2** are displayed before the `checkpoint diff` command, so that you can see the context of the **checkpoint diff** command.

```
switch# show checkpoint cp1
Checkpoint configuration:
!
!Version AOS-CX XL.10.00.0002
!Schema version 0.1.8
module 1/1 product-number jl363a
!
!
!
!
!
!
!
vlan 1,200
interface 1/1/1
    no shutdown
    ip address 1.0.0.1/24
```

```
interface 1/1/2
    no shutdown
    ip address 2.0.0.1/24

switch# show checkpoint cp2
Checkpoint configuration:
!
!Version AOS-CX XL.10.00.0002
!Schema version 0.1.8
module 1/1 product-number jl363a
!
!
!
!
!
!
!
vlan 1,200,300
interface 1/1/1
    no shutdown
    ip address 1.0.0.1/24
interface 1/1/2
    no shutdown
    ip address 2.0.0.1/24

switch# checkpoint diff cp1 cp2
--- /tmp/chkpt11501550258421    2017-08-01 01:17:38.420514016 +0000
+++ /tmp/chkpt21501550258421    2017-08-01 01:17:38.420514016 +0000
@@ -9,7 +9,7 @@
 !
 !
 !
-vlan 1,200
+vlan 1,200,300
 interface 1/1/1
     no shutdown
     ip address 1.0.0.1/24
```

```
switch# checkpoint diff chkpt01 chkpt02
--- /tmp/chkpt011607564301327
+++ /tmp/chkpt021607564301353
@@ -1,7 +1,7 @@
 !
 !Version AOS-CX PL.10.06.0100V
 !export-password: default
-hostname Switch
+hostname Switch1
 user admin group administrators password ciphertext
AQBapTyg9tpaiAaTfSVV5eNdFzOORRvZ6CMpglh1P+LQUHQLYgAAAGAhmRqFbkNvrgy2SBVk7H8C5hvg/I
ib8rWYFZLEaSCrobNP9EwMu+hLNM0xmsh45yG8dncP7WkxjwrW4p4Qra6dVfr0EW8xh/lpQf8F/2Wki20L
c9JLXiYge7ti0H6cVn+G
 radius-server tracking interval 60
 no usb

switch#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

checkpoint post-configuration

```
checkpoint post-configuration
```

```
no checkpoint post-configuration
```

Description

Enables creation of system generated checkpoints when configuration changes occur. This feature is enabled by default.

The **no** form of this command disables system generated checkpoints.

Usage

System generated checkpoints are automatically created by default. Whenever a configuration change occurs, the switch starts a timeout counter (300 seconds by default). For each additional configuration change, the timeout counter is restarted. If the timeout expires with no additional configuration changes being made, the switch generates a new checkpoint.

System generated checkpoints are named with the prefix **CPC** followed by a time stamp in the format **<YYYYMMDDHHMMSS>**. For example: **CPC20170630073127**.

System checkpoints can be applied using the checkpoint rollback feature or copy command.

A maximum of 32 system checkpoints can be created. Beyond this limit, the newest system checkpoint replaces the oldest system checkpoint.

Examples

Enabling system checkpoints:

```
switch(config)# checkpoint post-configuration
```

Disabling system checkpoints:

```
switch(config)# no checkpoint post-configuration
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

checkpoint post-configuration timeout

```
checkpoint post-configuration timeout <TIMEOUT>
```

```
no checkpoint post-configuration timeout <TIMEOUT>
```

Description

Sets the timeout for the creation of system checkpoints. The timeout specifies the amount of time since the latest configuration for the switch to create a system checkpoint.

The **no** form of this command resets the timeout to 300 seconds, regardless of the value of the **<TIMEOUT>** parameter.

Parameter	Description
`timeout <TIMEOUT>`	Specifies the timeout in seconds. Range: 5 to 600. Default: 300.

Examples

Setting the timeout for system checkpoints to 60 seconds:

```
switch(config)# checkpoint post-configuration timeout 60
```

Resetting the timeout for system checkpoints to 300 seconds:

```
switch(config)# no checkpoint post-configuration timeout 1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

checkpoint rename

`checkpoint rename <OLD-CHECKPOINT-NAME> <NEW-CHECKPOINT-NAME>`

Description

Renames an existing checkpoint.

Parameter	Description
`<OLD-CHECKPOINT-NAME>`	Specifies the name of an existing checkpoint to be renamed.
`<NEW-CHECKPOINT-NAME>`	Specifies the new name for the checkpoint. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-). **NOTE:** Do not start the checkpoint name with **CPC** because it is used for system-generated checkpoints.

Examples

Renaming checkpoint **ckpt1** to **cfg001**:

```
switch# checkpoint rename ckpt1 cfg001
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

checkpoint rollback

`checkpoint rollback {<CHECKPOINT-NAME> | startup-config}`

Description

Applies the configuration from a pre-existing checkpoint or the startup configuration to the running configuration.

Parameter	Description
<CHECKPOINT-NAME>	Specifies a checkpoint name.
`startup-config`	Specifies the startup configuration.

Examples

Applying a checkpoint named **ckpt1** to the running configuration:

```
switch# checkpoint rollback ckpt1
Success
```

Applying a startup checkpoint to the running configuration:

```
switch# checkpoint rollback startup-config
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy checkpoint *<CHECKPOINT-NAME>* *<REMOTE-URL>*

```
copy checkpoint <CHECKPOINT-NAME> <REMOTE-URL> [vrf <VRF-NAME>]
```

Description

Copies a checkpoint configuration to a remote location as a file. The configuration is exported in checkpoint format, which includes switch configuration and relevant metadata.

Parameter	Description
<CHECKPOINT-NAME>	Specifies the name of a checkpoint.

<REMOTE-URL>	Specifies the remote destination and filename using the syntax:
	TFTP format:
	`tftp://<IP-ADDR>[:<PORT-NUM>]`
	`[;blocksize=<Value>]/<FILENAME>`
	SFTP format:
	`sftp://<USERNAME>@<IP-ADDR>`
	`[:<PORT-NUM>]/<FILENAME>`
	SCP format:
	`scp://USER@{IP|HOST}[:PORT]/FILE`

`vrf` *<VRF-NAME>*	Specifies a VRF name.

Examples

Copying checkpoint configuration to remote file through TFTP:

```
switch# copy checkpoint ckpt1 tftp://192.168.1.10/ckptmeta vrf default
########################################################################## 100.0%
Success
```

Copying checkpoint configuration to remote file through SFTP:

```
switch# copy checkpoint ckpt1 sftp://root@192.168.1.10/ckptmeta vrf default
The authenticity of host '192.168.1.10 (192.168.1.10)' can't be established.
ECDSA key fingerprint is SHA256:FtOm6Uxuxumil7VCwLnhz92H9LkjY+eURbdddOETy50.
Are you sure you want to continue connecting (yes/no)? yes
root@192.168.1.10's password:
sftp> put /tmp/ckptmeta ckptmeta
Uploading /tmp/ckptmeta to /root/ckptmeta
Warning: Permanently added '192.168.1.10' (ECDSA) to the list of known hosts.
Connected to 192.168.1.10.
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy checkpoint <*CHECKPOINT-NAME*> {running-config | startup-config}

```
copy checkpoint <CHECKPOINT-NAME> {running-config | startup-config}
```

Description

Copies an existing checkpoint configuration to the running configuration or to the startup configuration.

Parameter	Description
<CHECKPOINT-NAME>	Specifies the name of an existing checkpoint.
	Selects whether the running configuration or the startup configuration receives the copied checkpoint configuration. If the startup configuration is already present, the command overwrites the startup configuration.

Examples

Copying **ckpt1** checkpoint to the running configuration:

```
switch# copy checkpoint ckpt1 running-config
Success
```

Copying **ckpt1** checkpoint to the startup configuration:

```
switch# copy checkpoint ckpt1 startup-config
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy checkpoint <*CHECKPOINT-NAME*> <*STORAGE-URL*>

```
copy checkpoint <CHECKPOINT-NAME> <STORAGE-URL>
```

Description

Copies an existing checkpoint configuration to a USB drive. The file format is defined when the checkpoint was created.

Parameter	Description
<CHECKPOINT-NAME>	Specifies the name of the checkpoint to copy. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-).
<STORAGE-URL>>	Specifies the name of the target file on the USB drive using the following syntax: `usb:/`*`<FILE>`* The USB drive must be formatted with the FAT file system.

Examples

Copying the **test** checkpoint to the **testCheck** file on the USB drive:

```
switch# copy checkpoint test usb:/testCheck
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy *<REMOTE-URL>* checkpoint *<CHECKPOINT-NAME>*

```
copy <REMOTE-URL> checkpoint <CHECKPOINT-NAME> [vrf <VRF-NAME>]
```

Description

Copies a remote configuration file to a checkpoint. The remote configuration file must be in checkpoint format.

Parameter	Description
<REMOTE-URL>	Specifies a remote file using the following syntax: **TFTP format:**

Parameter	Description
	tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME> **SFTP format:** sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME> **SCP format:** scp://USER@{IP|HOST}[:PORT]/FILE
<CHECKPOINT-NAME>	Specifies the name of the target checkpoint. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-). Required. **NOTE:** Do not start the checkpoint name with CPC because it is used for system-generated checkpoints.
vrf <VRF-NAME>	Specifies a VRF name. Default: default.

Examples

Copying a checkpoint format file to checkpoint **ckpt5** on the default VRF:

```
switch# copy tftp://192.168.1.10/ckptmeta checkpoint ckpt5
########################################################################## 100.0%
100.0%
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy <*REMOTE-URL*> {running-config \| startup-config}

```
copy <REMOTE-URL> {running-config | startup-config } [vrf <VRF-NAME>]
```

Description

Copies a remote file containing a switch configuration to the running configuration or to the startup configuration.

Parameter	Description

<REMOTE-URL>	Specifies a remote file with the following syntax:
	TFTP format:
	`tftp://<IP-ADDR>[:<PORT-NUM>]`
	`[;blocksize=<Value>]/<FILENAME>`
	SFTP format:
	`sftp://<USERNAME>@<IP-ADDR>`
	`[:<PORT-NUM>]/<FILENAME>`
	SCP format:
	`scp://USER@{IP|HOST}[:PORT]/FILE`

`{running-config | startup-config}`	Selects whether the running configuration or the startup configuration receives the copied checkpoint configuration. If the startup configuration is already present, the command overwrites the startup configuration.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Usage

The switch copies only certain file types. The format of the file is automatically detected from contents of the file. The **startup-config** option only supports the JSON file format and checkpoints, but the **running-config** option supports the JSON and CLI file formats and checkpoints.

When a file of the CLI format is copied, it overwrites the running configuration. The CLI command does not clear the running configuration before applying the CLI commands. All of the CLI commands in the file are applied line-by-line. If a particular CLI command fails, the switch logs the failure and it continues to the next line in the CLI configuration. The event log (**show events -d hpe-config**) provides information as to which command failed.

Examples

Copying a JSON format file to the running configuration:

```
switch# copy tftp://192.168.1.10/runjson running-config
########################################################################## 100.0%
Configuration may take several minutes to complete according to configuration file
size
 --0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
Success
```

Copying a CLI format file to the running configuration with an error in the file:

```
switch# copy tftp://192.168.1.10/runcli running-config
########################################################################## 100.0%
Configuration may take several minutes to complete according to configuration file
size
 --0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
Some of the configuration lines from the file were NOT applied. Use 'show
events -d hpe-config' for more info.
########################################################################## 100.0%
Configuration may take several minutes to complete according to configuration file
size
 --0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
Some of the configuration lines from the file were NOT applied. Use 'show
events -d hpe-config' for more info.
```

Copying a CLI format file to the startup configuration:

```
switch# copy tftp://192.168.1.10/startjson startup-config
######################################################################## 100.0%
100.0%
Success
```

Copying an unsupported file format to the startup configuration:

```
switch# copy tftp://192.168.1.10/startfile startup-config
######################################################################## 100.0%
100.0%
unsupported file format
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy running-config {startup-config | checkpoint <*CHECKPOINT-NAME*>}

`copy running-config {startup-config | checkpoint <CHECKPOINT-NAME>}`

Description

Copies the running configuration to the startup configuration or to a new checkpoint. If the startup configuration is already present, the command overwrites the existing startup configuration.

Parameter	Description
`startup-config`	Specifies that the startup configuration receives a copy of the running configuration.
`checkpoint <CHECKPOINT-NAME>`	Specifies the name of a new checkpoint to receive a copy of the running configuration. The checkpoint name can be comprised of alphanumeric character, underscores (_) and dashes (-), and must be 32 characters or fewer.

Parameter	Description
	NOTE: Do not start the checkpoint name with **CPC** because it is used for system-generated checkpoints.

Examples

Copying the running configuration to the startup configuration:

```
switch# copy running-config startup-config
Success
```

Copying the running configuration to a new checkpoint named **ckpt1**:

```
switch# copy running-config checkpoint ckpt1
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy {running-config | startup-config} *<REMOTE-URL>*

`copy {running-config | startup-config} <REMOTE-URL> {cli | json} [vrf <VRF-NAME>]`

Description

Copies the running configuration or the startup configuration to a remote file in either CLI or JSON format.

Parameter	Description
`{running-config	startup-config}`	Selects whether the running configuration or the startup configuration is copied to a remote file.
<REMOTE-URL>	Specifies the remote file using the syntax:

Parameter	Description

	TFTP format:
	`tftp://<IP-ADDR>[:<PORT-NUM>]`
	`[;blocksize=<Value>]/<FILENAME>`
	SFTP format:
	`sftp://<USERNAME>@<IP-ADDR>`
	`[:<PORT-NUM>]/<FILENAME>`
	SCP format:
	`scp://USER@{IP|HOST}[:PORT]/FILE`

`{cli | json}`	Selects the remote file format: P: CLI or JSON.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Examples

Copying a running configuration to a remote file in CLI format:

```
switch# copy running-config tftp://192.168.1.10/runcli cli
######################################################################### 100.0%
Success
```

Copying a running configuration to a remote file in JSON format:

```
switch# copy running-config tftp://192.168.1.10/runjson json
######################################################################### 100.0%
Success
```

Copying a startup configuration to a remote file in CLI format:

```
switch# copy startup-config sftp://root@192.168.1.10/startcli cli
root@192.168.1.10's password:
sftp> put /tmp/startcli startcli
Uploading /tmp/startcli to /root/startcli
Connected to 192.168.1.10.
Success
```

Copying a startup configuration to a remote file in JSON format:

```
switch# copy startup-config sftp://root@192.168.1.10/startjson json
root@192.168.1.10's password:
sftp>
root@192.168.1.10's password:
sftp> put /tmp/startjson startjson
Uploading /tmp/startjson to /root/startjson
Connected to 192.168.1.10.
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy {running-config | startup-config} *<STORAGE-URL>*

`copy {running-config | startup-config} <STORAGE-URL> {cli | json}`

Description

Copies the running configuration or a startup configuration to a USB drive.

Parameter	Description
`{running-config	startup-config}`	Selects the running configuration or the startup configuration to be copied to the switch USB drive.
`<STORAGE-URL>`	Specifies a remote file with the following syntax: **usb:/*<file>***
`{cli	json}`	Selects the format of the remote file: CLI or JSON.

Usage

The switch supports JSON and CLI file formats when copying the running or starting configuration to the USB drive. The USB drive must be formatted with the FAT file system.

The USB drive must be enabled and mounted with the following commands:

```
switch(config)# usb
switch(config)# end
switch# usb mount
```

Examples

Copying a running configuration to a file named **runCLI** on the USB drive:

```
switch# copy running-config usb:/runCLI cli
Success
```

Copying a startup configuration to a file named **startCLI** on the USB drive:

```
switch# copy startup-config usb:/startCLI cli
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy startup-config running-config

```
copy startup-config running-config
```

Description

Copies the startup configuration to the running configuration.

Examples

```
switch# copy startup-config running-config
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy <*STORAGE-URL*> running-config

```
copy <STORAGE-URL> {running-config | startup-config | checkpoint <CHECKPOINT-NAME>}
```

Description

This command copies a specified configuration from the USB drive to the running configuration, to a startup configuration, or to a checkpoint.

Parameter	Description
<STORAGE-URL>	Specifies the name of a configuration file on the USB drive with the syntax: **usb:/<*FILE*>**
running-config	Specifies that the configuration file is copied to the running configuration. The file must be in CLI, JSON, or checkpoint format or the copy will fail. the copy will not work.
startup-config	Specifies that the configuration file is copied to the startup configuration. The switch stores this configuration between reboots. The startup configuration is used as the operating configuration following a reboot of the switch. The file must be in JSON or checkpoint format or the copy will fail.
checkpoint *<CHECKPOINT-NAME>*	Specifies the name of a new checkpoint file to receive a copy of the configuration. The configuration file on the USB drive must be in checkpoint format. **NOTE:** Do not start the checkpoint name with **CPC** because it is used for system-generated checkpoints.

Usage

This command requires that the USB drive is formatted with the FAT file system and that the file be in the appropriate format as follows:

- **running-config**: This option requires the file on the USB drive be in CLI, JSON, or checkpoint format.
- **startup-config**: This option requires the file on the USB drive be in JSON or checkpoint format.
- **checkpoint <*checkpoint-name*>**: This option requires the file on the USB drive be in checkpoint format.

Examples

Copying the file **runCli** from the USB drive to the running configuration:

```
switch# copy usb:/runCli running-config
Configuration may take several minutes to complete according to configuration
file size
--0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
Success
```

Copying the file **startUp** from the USB drive to the startup configuration:

```
switch# copy usb:/startUp startup-config
Success
```

Copying the file **testCheck** from the USB drive to the **abc** checkpoint:

```
switch# copy usb:/testCheck checkpoint abc
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

erase

```
erase
   checkpoint <checkpont-name>
   core-dump all|daemon|dsm|kernel|vsf
   startup-config
   all
```

Description

Deletes an existing checkpoint, startup configuration, or core-dump.

Parameter	Description
`checkpoint <CHECKPOINT-NAME>`	Specifies the name of a checkpoint.

`core-dump`
`all|daemon <daemon-name>`
`|kernel|vsf`
	Erase one of the following sets of core-dump files:
	▪ all: Erase all core-dump files.
	▪ daemon <daemon-name>: Erase daemon core-dump files.
	▪ kerne:l Erase the kernel core-dump.
	▪ vsf Erase daemon core-dump files for VSF. (For 6300 Switches only.)

startup-config	Specifies the startup configuration.
all	Specifies all checkpoints.

Examples

Erasing checkpoint **ckpt1**:

```
switch# erase checkpoint ckpt1
```

Erasing the startup configuration:

```
switch# erase startup-config
```

Erasing all checkpoints:

```
switch# erase checkpoint all
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show checkpoint <*CHECKPOINT-NAME*>

```
show checkpoint <CHECKPOINT-NAME> [json]
```

Description

Shows the configuration of a checkpoint.

Parameter	Description
<CHECKPOINT-NAME>	Specifies the name of a checkpoint.
[json]	Specifies that the output is displayed in JSON format.

Examples

Showing the configuration of the **ckpt1** checkpoint in CLI format:

```
switch# show checkpoint ckpt1
Checkpoint configuration:
!
!Version AOS-CX PL.10.07.0000K-75-g55e5193
```

```
!export-password: default
lacp system-priority 65535
user admin group administrators password ciphertext
AQBapQjwipebv36io0jFfde7ZzrHckncal1D+3n8XFTZKQdmYgAAADEtYOeHSme93xzdD0uz6Vr9Kl+XBz
B+2GB0UBxSF7rvgN2x8KSgkqv7iqXVQ0Te6LkSMnH4BdNaT3Bf25qyvOqmr4YakO1V3rg8zAOADkPktQD8
joTHXflzwomoIzcmv/uX
cli-session
    timeout 0
!
!
!
!
ssh server vrf default
vlan 1
spanning-tree
interface lag 1
    no shutdown
    vlan access 1
interface lag 128
    no shutdown
    vlan access 1
interface lag 129
    shutdown
    vlan access 1
    lacp mode active
interface 1/1/1
    no shutdown
    lag 128
    lacp port-id 65535
interface 1/1/2
    no shutdown
    vlan access 1
interface 1/1/3
    no shutdown
    vlan access 1
interface 1/1/4
    no shutdown
    vlan access 1
interface 1/1/5
    no shutdown
    vlan access 1
interface 1/1/6
    no shutdown
    vlan access 1
interface 1/1/7
    no shutdown
    vlan access 1
interface 1/1/8
    no shutdown
    vlan access 1
interface 1/1/9
    no shutdown
    vlan access 1
interface 1/1/10
    no shutdown
    vlan access 1
interface 1/1/11
    no shutdown
    vlan access 1
interface 1/1/12
    no shutdown
    vlan access 1
```

```
interface 1/1/13
    no shutdown
    vlan access 1
interface 1/1/14
    no shutdown
    vlan access 1
interface 1/1/15
    no shutdown
    vlan access 1
interface 1/1/16
    no shutdown
    vlan access 1
interface vlan 1
    ip dhcp
snmp-server vrf default
!
!
!
!
!
https-server vrf default
```

Showing the configuration of the **ckpt1** checkpoint in JSON format:

```
switch# show checkpoint ckpt1 json
Checkpoint configuration:
{
    "AAA_Server_Group": {
        "local": {
            "group_name": "local"
        },
        "none": {
            "group_name": "none"
        }
    },
...
...
...
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show checkpoint <*CHECKPOINT-NAME*> hash

```
show checkpoint <CHECKPOINT-NAME> hash [cli | json]
```

Description

Shows a configuration checkpoint hash calculated with the SHA-256 algorithm. When the output format is not specified, the CLI format is used. This enables you to determine whether there has been a configuration change since a previous hash was calculated.

Parameter	Description
`<CHECKPOINT-NAME>`	Specifies an existing checkpoint name.
`[cli | json]`	Selects either the CLI or JSON format.

Examples

Showing a checkpoint SHA-256 hash in JSON format:

```
switch# show checkpoint ckpt1 hash json
Calculating the hash: [Success]

The SHA-256 hash of the checkpoint in JSON format, created in image XX.10.08.xxxx:

cc7a57a9bbb4e6600d3b4180296a35f6af9e797ce9c439955dfe5de58b06da9e

This hash is only valid for comparison to a baseline hash if the configuration has
not been explicitly changed (such as with a CLI command, REST operation, etc.)
or implicitly changed (such as by changing a hardware module, upgrading the
SW version, etc.).
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show checkpoint post-configuration

```
show checkpoint post-configuration
```

Description

Shows the configuration settings for creating system checkpoints.

Examples

```
switch# show checkpoint post-configuration

Checkpoint Post-Configuration feature
-------------------------------------

 Status                : enabled
 Timeout (sec) : 300
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show checkpoint

```
show checkpoint
```

Description

Shows a detailed list of all saved checkpoints.

Examples

Showing a detailed list of all saved checkpoints:

```
switch# show checkpoint

NAME             TYPE        WRITER  DATE(YYYY/MM/DD)      IMAGE VERSION
ckpt1            checkpoint  User    2017-02-23T00:10:02Z  XX.01.01.000X
ckpt2            checkpoint  User    2017-03-08T18:10:01Z  XX.01.01.000X
ckpt3            checkpoint  User    2017-03-09T23:11:02Z  XX.01.01.000X
ckpt4            checkpoint  User    2017-03-11T00:00:03Z  XX.01.01.000X
ckpt5            latest      User    2017-03-14T01:12:27Z  XX.01.01.000X
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command syntax `show checkpoint list all` is replaced with `show checkpoint`.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show checkpoint date

`show checkpoint date <START-DATE> <END-DATE>`

Description

Shows detailed list of all saved checkpoints created within the specified date range.

Parameter	Description
<START-DATE>	Specifies the starting date for the range of saved checkpoints to show. Format: **YYYY-MM-DD**.
<END-DATE>	Specifies the endingdate for the range of saved checkpoints to show. Format: **YYYY-MM-DD**.

Examples

Showing a detailed list of saved checkpoints for a specific date range:

```
switch# show checkpoint date 2017-03-08 2017-03-12

NAME                    TYPE        WRITER   DATE(YYYY/MM/DD)      IMAGE VERSION
ckpt2                   checkpoint  User     2017-03-08T18:10:01Z  XX.01.01.000X
ckpt3                   checkpoint  User     2017-03-09T23:11:02Z  XX.01.01.000X
ckpt4                   checkpoint  User     2017-03-11T00:00:03Z  XX.01.01.000X
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command syntax `show checkpoint list date <START-`

Release	Modification
	DATE> <END-DATE> is replaced with `show checkpoint date` *<START-DATE> <END-DATE>*
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config hash

`show running-config hash [cli | json]`

Description

Shows the running-config checkpoint hash, calculated with the SHA-256 algorithm. When the output format is not specified, the CLI format is used. This enables you to determine whether there has been a configuration change since a previous hash was calculated.

Parameter	Description
`[cli	json]`	Selects either the CLI or JSON format.

Examples

Showing the running-config checkpoint SHA-256 hash in CLI format:

```
switch# show running-config hash cli
Calculating the hash: [Success]

SHA-256 hash of the config in CLI format:

8db4e7e10f4b7f1a6ab17ad2b4efe0e72f1849103eaf43da62aa1d715075b89e

This hash is only valid for comparison to a baseline hash if the configuration has
not been explicitly changed (such as with a CLI command, REST operation, etc.)
or implicitly changed (such as by changing a hardware module, upgrading the
SW version, etc.).
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show startup-config hash

```
show startup-config hash [cli | json]
```

Description

Shows the startup-config checkpoint hash, calculated with the SHA-256 algorithm. When the output format is not specified, the CLI format is used. This enables you to determine whether there has been a configuration change since a previous hash was calculated.

Parameter	Description
`[cli	json]`	Selects either the CLI or JSON format.

Examples

Showing the startup-config checkpoint SHA-256 hash in CLI format:

```
switch# show startup-config hash cli
Calculating the hash: [Success]

SHA-256 hash of the config in CLI format:

8db4e7e10f4b7f1a6ab17ad2b4efe0e72f1849103eaf43da62aa1d715075b89e

This hash is only valid for comparison to a baseline hash if the configuration has
not been explicitly changed (such as with a CLI command, REST operation, etc.)
or implicitly changed (such as by changing a hardware module, upgrading the
SW version, etc.).
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

write memory

```
write memory
```

Description

Saves the running configuration to the startup configuration. It is an alias of the command **copy running-config startup-config**. If the startup configuration is already present, this command overwrites the startup configuration.

Examples

```
switch# write memory
Success
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

Chapter 18
Classifier policy commands

Classifier policy application

Classifier policies can be applied as follows ("Rt-In" = "Routed-In"):

Policy type Direction	IPv4+6 In	IPv4+6 Rt-In	IPv4+6 Out	MAC In	MAC Out
L2 interface (port)	Yes		Yes	Yes	Yes
L2 LAG	Yes		Yes	Yes	Yes
L3 interface (port)	Yes	Yes	Yes	Yes	Yes
L3 LAG	Yes	Yes	Yes	Yes	Yes
L3 interface (port) subinterface	Yes		Yes		
L3 LAG subinterface	Yes		Yes		
VLAN	Yes		Yes	Yes	Yes
Interface VLAN		Yes (PBR)			

The following match criteria is not supported. If this match criteria is attempted to be configured, an error message will be displayed and the action will not be completed.

```
PCP on MAC classes
```

apply policy (config-if, config-lag-if, config-if-vlan, config-vlan)

Context config-if, config-lag-if:

```
apply policy <POLICY-NAME> {in|out|routed-in} [per-interface]
no apply policy <POLICY-NAME> {in|out|routed-in} [per-interface]
```

Context config-vlan:

```
apply policy <POLICY-NAME> {in|out}
no apply policy <POLICY-NAME> {in|out}
```

Context config-if-vlan:

```
apply policy <POLICY-NAME> routed-in
no apply policy <POLICY-NAME> routed-in
```

Description

Applies a policy to the current physical interface port or LAG or VLAN context. Subinterfaces are supported on interfaces and LAGs.

Only one direction of a policy can be applied to an interface or VLAN at a time, thus using the apply command on an interface or VLAN with an already-applied policy of the same direction will replace the currently applied policy.

The VLAN context supports the **in** and **out** directions, which apply to both bridged and routed traffic. The Interface VLAN context only supports the **routed-in** direction which applies only to routed traffic.

The **no** form of this command removes a policy from the interface or VLAN specified by the current context.

Parameter	Description
<POLICY-NAME>	Specifies the policy to apply.
`in`	Selects the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction.
`routed-in`	Selects routed in traffic.
`per-interface`	Specifies that unique instances of the policy be applied to each interface or LAG rather than the default of sharing the policy across all interfaces and LAGs.

Usage (applies to `config-if`, `config-lag-if` contexts)

- The subinterface can optionally be specified after the interface or LAG, preceded by a period. For example, **1/1/1.10** or **lag 125.4**.
- When `per-interface` is included, unique instances of the policy are applied to each physical interface port or LAG rather than the default of sharing the policy across all interfaces and LAGs. The unique instance of a policy has a parent-child relationship with the policy from which it was created. The **per-interface** option is useful when you want unique policers to be created for each interface or LAG rather than using shared policers. It is also useful when you want the statistics (hit counts and conform rate) to be specific to an interface or LAG rather than being aggregated. Because **per-interface** creates more hardware instances of a policy, resource consumption may increase significantly. It is recommended that you use **show resources** to monitor resource utilization as configuration is applied.

Usage (applies to config-vlan context)

- Only one policy type may be applied to a VLAN at a time. Therefore, using the **apply policy** command on a VLAN with an already-applied policy of the same type, will replace the applied policy.
- 6400 Switch Series only: When a policy is applied to a VLAN, it will create hardware entries on all line cards and stack members regardless of whether a VLAN member exists on any specific line card.

Examples

On the 6400 Switch Series, interface identification differs.

Applying a policy to an interface (ingress):

```
switch(config)# interface 1/1/1
switch(config-if)# apply policy MY_POLICY1 in
```

Applying a policy to an interface (ingress) specifying **per-interface**:

```
switch(config)# interface 1/1/2
switch(config-if)# apply policy MY_POLICY1 in per-interface
```

Applying a policy to an interface (egress):

```
switch(config)# interface 1/1/2
switch(config-if)# apply policy MY_POLICY2 out
```

Applying a policy to an interface (egress) specifying `per-interface`:

```
switch(config)# interface 1/1/2
switch(config-if)# apply policy MY_POLICY2 out per-interface
```

Applying a policy to an interface range (ingress):

```
switch(config)# interface 1/1/3-1/1/6
switch(config-if-<1/1/2-1/1/5>)# apply policy MY_POLICY3 in
```

Applying a policy to an interface range (ingress) specifying **per-interface**:

```
switch(config)# interface 1/1/7-1/1/9
switch(config-if-<1/1/2-1/1/5>)# apply policy MY_POLICY4 in per-interface
```

Removing a policy from an interface (ingress):

```
switch(config)# interface 1/1/1
switch(config-if)# no apply policy MY_POLICY1 in
```

Removing a policy from an interface range (ingress):

```
switch(config)# interface 1/1/3-1/1/6
switch(config-if-<1/1/3-1/1/6>)# no apply policy MY_POLICY3 in
```

Applying a policy to a subinterface (ingress):

```
switch(config)# interface 1/1/1.10
switch(config-if)# apply policy MY_POLICY1 in
```

Applying a policy to a subinterface (egress):

```
switch(config)# interface 1/1/2.8
switch(config-if)# apply policy MY_POLICY1_egr out
```

Applying a policy to a LAG (ingress):

```
switch(config)# interface lag 100
switch(config-lag-if)# apply policy MY_POLICY5 in
```

Applying a policy to a LAG (ingress) specifying **per-interface**:

```
switch(config)# interface lag 200
switch(config-lag-if)# apply policy MY_POLICY5 in per-interface
```

Removing a policy from a LAG (ingress):

```
switch(config)# interface lag 100
switch(config-lag-if)# no apply policy MY_POLICY5 in
```

Applying a policy to a LAG subinterface (ingress):

```
switch(config)# interface lag 125.4
switch(config-lag-if)# apply policy MY_POLICY5 in
```

Applying a policy to a LAG subinterface (egress):

```
switch(config)# interface lag 150.8
switch(config-lag-if)# apply policy MY_POLICY5 out
```

Applying a policy to a VLAN (ingress):

```
switch(config)# vlan 1
switch(config-vlan)# apply policy MY_POLICY6 in
```

Applying a policy to multiple VLANs (ingress):

```
switch(config)# vlan 10,20
switch(config-vlan-<10,20>)# apply policy MY_POLICY7 in
```

Applying a policy to an interface VLAN routed (ingress):

```
switch(config)# vlan 1
switch(config-if-vlan)# apply policy MY_POLICY8 routed-in
```

Applying a policy to an interface VLAN range routed (ingress):

```
switch(config)# vlan 2-5
switch(config-if-vlan-<2-5>)# apply policy MY_POLICY8 routed-in
```

Removing a policy from a VLAN (ingress):

```
switch(config)# vlan 1
switch(config-vlan)# no apply policy MY_POLICY6 in
```

Removing a policy from multiple VLANs (ingress):

```
switch(config)# vlan 10,20
switch(config-vlan-<10,20>)# no apply policy MY_POLICY7 in
```

Removing a policy from an interface VLAN routed (ingress):

```
switch(config)# vlan 1
switch(config-if-vlan)# no apply policy MY_POLICY8 routed-in
```

Removing a policy from an interface VLAN range routed (ingress):

```
switch(config)# vlan 2-5
switch(config-if-vlan-<2-5>)# no apply policy MY_POLICY8 routed-in
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.10	Added subinterface egress support for interfaces and LAGs.
10.08	Added **[per-interface]** parameter.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if`
	`config-lag-if`
	`config-vlan`
	`config-if-vlan`
		Administrators or local user group members with execution rights for this command.

apply policy

```
apply policy <POLICY-NAME> in
```

```
no apply policy <POLICY-NAME> in
```

Description

Applies a policy to the global config context.

Only one policy can be globally applied at a time. Applying a policy globally again, replaces the previous globally applied policy.

The **no** form of this command removes application of the global policy.

Parameter	Description
<POLICY-NAME>	Specifies the policy to apply.
in	Selects the inbound (ingress) traffic direction.

Examples

Applying policy global1 to the global config context:

```
switch(config)# apply policy global1 in
```

Removing application of policy global1 from the global config context:

```
switch(config)# no apply policy global1 in
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

class copy

```
class {ip|ipv6|mac} <CLASS-NAME> copy <DESTINATION-CLASS>
```

Description

Copies a class to a new destination class or overwrites an existing class. Copying a class copies all entries as well.

Parameter	Description
{ip|ipv6|mac**}** *<CLASS-NAME>*	Specifies the type and name of the class to be copied.
<DESTINATION-CLASS>	Specifies the name of the destination class.

Examples

Copying an IPv4 class. Copying a class with entries copies all its entries as well:

```
switch(config)# class ip MY_IP_CLASS copy MY_IP_CLASS2
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
       11  ignore                          udp
           any
           any
       21  match                           tcp
           192.168.0.1
           192.168.0.2
-------------------------------------------------------------------------------
IPv4       MY_IP_CLASS2
       11  ignore                          udp
           any
           any
       21  match                           tcp
           192.168.0.1
           192.168.0.2
```

Copying an IPv6 class:

```
switch(config)# class ipv6 MY_IPV6_CLASS copy MY_IPV6_CLASS2
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
         2 ignore                          udp
           any
           any
-------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS2
         2 ignore                          udp
           any
           any
```

Copying a MAC class:

```
switch(config)# class mac MY_MAC_CLASS copy MY_MAC_CLASS2
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_CLASS
         2 ignore                          arp
           any
           any
-------------------------------------------------------------------------------
MAC        MY_MAC_CLASS2
         2 ignore                          arp
           any
           any
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

class ip

Syntax to create an IPv4 class and enter its context. Plus syntax to remove a class:

```
class ip <CLASS-NAME>
no class ip <CLASS-NAME>
```

Syntax (within the class context) for creating or removing class entries for protocols **ah**, **gre**, **esp**, **igmp**, **ospf**, **pim** (**ip** is available as an alias for **any**):

```
  [<SEQUENCE-NUMBER>]
  {match|ignore}
  {any|ip|ah|gre|esp|igmp|ospf|pim|<IP-PROTOCOL-NUM>}
  {any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
  {any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
  [dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
  [tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count]

  no <SEQUENCE-NUMBER>
```

Syntax (within the class context) for creating or removing class entries for protocols **sctp**, **tcp**, **udp**:

```
[<SEQUENCE-NUMBER>]
{match|ignore}
{sctp|tcp|udp}
{any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
[{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>]
{any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
[{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>]
[cwr][ece] [urg] [ack] [psh] [rst] [syn] [fin] [established]
[dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
[tos <TOS-VALUE>]  [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count]

no <SEQUENCE-NUMBER>
```

Syntax (within the class context) for creating or removing class entries for protocol **icmp**:

```
[<SEQUENCE-NUMBER>]
{match|ignore}
{icmp}
{any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
{any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
[icmp-type {echo|echo-reply|<ICMP-TYPE-VALUE>}] [icmp-code <ICMP-CODE-VALUE>]
[dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
[tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count]

no <SEQUENCE-NUMBER>
```

Syntax (within the class context) for class entry comments:

```
[<SEQUENCE-NUMBER>] comment <TEXT-STRING>

no <SEQUENCE-NUMBER> comment
```

Description

Creates or modifies an IPv4 traffic class to match specified packets. Class is composed of one or more class entries ordered and prioritized by sequence numbers. With this command, the class can classify traffic based on IPv4 header information.

The **no** form of the command can be used to delete either an IPv4 traffic class (use **no** with the class command) or an individual IPv4 traffic class entry (use **no** with the sequence number).

Parameter	Description
`ip`	Specifies create or modify an IPv4 class.
`<CLASS-NAME>`	Specifies the name of this class.
`<SEQUENCE-NUMBER>`	Specifies a sequence number for the class entry. Optional. Range: 1-4294967295.
`{match|ignore}`	Creates a rule to match or ignore specified packets.
`<IP-PROTOCOL-NUM>`	Specifies the protocol as its Internet Protocol number. For example, 2 corresponds to the IGMP protocol. Range: 0 to 255.
`{any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}`	Specifies the source IPv4 address. ▪ **any** - specifies any source IPv4 address. ▪ **<SRC-IP-ADDRESS>** - specifies the source IPv4 host address. ○ **<PREFIX-LENGTH>** - specifies the address bits to mask (CIDR subnet mask

Parameter	Description
	notation). Range: 1 to 32. ◦ **<SUBNET-MASK>** - specifies the address bits to mask (dotted decimal notation).
`{any|<DST-IP-ADDRESS> [/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}`	Specifies the destination IPv4 address. ▪ **any** - specifies any destination IPv4 address. ▪ **<DST-IP-ADDRESS>** - specifies the destination IPv4 host address. ◦ **<PREFIX-LENGTH>** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 32. ◦ **<SUBNET-MASK>** - specifies the address bits to mask (dotted decimal notation).
`[{eq|gt|lt} <PORT>|range <MIN-PORT><MAX-PORT>]`	Specifies the port or port range. Port numbers are in the range of 0 to 65535. ▪ **eq <PORT>** - specifies the Layer 4 port. ▪ **gt <PORT>** - specifies any Layer 4 port greater than the indicated port. ▪ **lt <PORT>** - specifies any Layer 4 port less than the indicated port. ▪ **range *<MIN-PORT>* *<MAX-PORT>*** - specifies the Layer 4 port range.
`cwr`	Specifies matching on the TCP Flag CWR : Congestion Window Reduced
`ece`	Specifies matching on the TCP Flag ECE : Explicit Congestion Notification [ECN]- Echo
`urg`	Specifies matching on the TCP Flag: Urgent.
`ack`	Specifies matching on the TCP Flag: Acknowledgment.
`psh`	Specifies matching on the TCP Flag: Push buffered data to receiving application.
`rst`	Specifies matching on the TCP Flag: Reset the connection.
`syn`	Specifies matching on the TCP Flag: Synchronize sequence numbers.
`fin`	Specifies matching on the TCP Flag: Finish connection.
`established`	Specifies matching on the TCP Flag: Established connection.
`dscp <DSCP-SPECIFIER>`	Specifies the Differentiated Services Code

Parameter	Description
	Point (DSCP), either a numeric **`<DSCP-VALUE>`** (0 to 63) or one of these keywords: ■ **AF11** - DSCP 10 (Assured Forwarding Class 1, low drop probability) ■ **AF12** - DSCP 12 (Assured Forwarding Class 1, medium drop probability) ■ **AF13** - DSCP 14 (Assured Forwarding Class 1, high drop probability) ■ **AF21** - DSCP 18 (Assured Forwarding Class 2, low drop probability) ■ **AF22** - DSCP 20 (Assured Forwarding Class 2, medium drop probability) ■ **AF23** - DSCP 22 (Assured Forwarding Class 2, high drop probability) ■ **AF31** - DSCP 26 (Assured Forwarding Class 3, low drop probability) ■ **AF32** - DSCP 28 (Assured Forwarding Class 3, medium drop probability) ■ **AF33** - DSCP 30 (Assured Forwarding Class 3, high drop probability) ■ **AF41** - DSCP 34 (Assured Forwarding Class 4, low drop probability) ■ **AF42** - DSCP 36 (Assured Forwarding Class 4, medium drop probability) ■ **AF43** - DSCP 38 (Assured Forwarding Class 4, high drop probability) ■ **CS0** - DSCP 0 (Class Selector 0: Default) ■ **CS1** - DSCP 8 (Class Selector 1: Scavenger) ■ **CS2** - DSCP 16 (Class Selector 2: OAM) ■ **CS3** - DSCP 24 (Class Selector 3: Signaling) ■ **CS4** - DSCP 32 (Class Selector 4: Realtime) ■ **CS5** - DSCP 40 (Class Selector 5: Broadcast video) ■ **CS6** - DSCP 48 (Class Selector 6: Network control) ■ **CS7** - DSCP 56 (Class Selector 7) ■ **EF** - DSCP 46 (Expedited Forwarding)
`ecn <ECN-VALUE>`	Specifies an Explicit Congestion Notification value. Range: 0 to 3.
`ip-precedence <IP-PRECEDENCE-VALUE>`	Specifies an IP precedence value. Range: 0 to 7.
`tos <TOS-VALUE>`	Specifies the Type of Service value. Range: 0 to 31.
`fragment`	Specifies a fragment packet.
`vlan <VLAN-ID>`	Specifies VLAN tag to match on. 802.1Q VLAN ID.

Parameter	Description
	NOTE: This parameter cannot be used in any class that will be applied to a VLAN.
`ttl <TTL-VALUE>`	Specifies a time-to-live (hop limit) value. Range: 0 to 255.
`count`	Keeps the hit counts of the number of packets matching this class entry.
`[<SEQUENCE-NUMBER>] comment <TEXT-STRING>`	Adds a comment to a class entry. The **no** form removes only the comment from the class entry.

Usage

- Entering an existing **<CLASS-NAME>** value will cause the existing class to be modified, with any new **<SEQUENCE-NUMBER>** value creating an additional class entry, and any existing **<SEQUENCE-NUMBER>** value replacing the existing class entry with the same sequence number.
- If no sequence number is specified, a new class entry will be appended to the end of the class with a sequence number equal to the highest class entry currently in the list plus 10.
- If the **<IP-PROTOCOL-NUM>** parameter is used instead of a protocol name, ensure that any needed class entry-definition parameters specific to the selected protocol are also provided.

Examples

Creating an IPv4 class with three entries:

```
switch(config)# class ip MY_IP_CLASS
switch(config-class-ip)# 10 match icmp any any10 match icmp any any
switch(config-class-ip)# 20 ignore udp any any
switch(config-class-ip)# 30 match tcp 192.168.0.1 192.168.0.2
switch(config-class-ip)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
        10 match                           icmp
           any
           any
        20 ignore                          udp
           any
           any
        30 match                           tcp
           192.168.0.1
           192.168.0.2
```

Adding a comment to an existing IPv4 class entry:

```
switch(config)# class ip MY_IP_CLASS
switch(config-class-ip)# 30 comment myipClass
switch(config-class-ip)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
        10 match                           icmp
           any
           any
        20 ignore                          udp
           any
           any
        30 myipClass
           match                           tcp
           192.168.0.1
           192.168.0.2
```

Removing a comment from an existing IPv4 class entry:

```
switch(config)# class ip MY_IP_CLASS
switch(config-class-ip)# no 30 comment
switch(config-class-ip)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
        10 match                           icmp
           any
           any
        20 ignore                          udp
           any
           any
        30 match                           tcp
           192.168.0.1
           192.168.0.2

Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
        10 match                           icmp
           any
           any
        20 ignore                          udp
```

```
           any
           any
        30 match                           tcp
           192.168.0.1
           192.168.0.2
```

Replacing an IPv4 class entry in an existing class:

```
switch(config)# class ip MY_IP_CLASS
switch(config-class-ip)# 10 match igmp any any
switch(config-class-ip)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
        10 match                           igmp
           any
           any
        20 ignore                          udp
           any
           any
        30 match                           tcp
           192.168.0.1
           192.168.0.2
```

Removing an IPv4 class entry:

```
switch(config)# class ip MY_IP_CLASS
switch(config-class-ip)# no 10
switch(config-class-ip)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
       20  ignore                          udp
           any
           any
       30  match                           tcp
           192.168.0.1
           192.168.0.2
```

Removing an IPv4 class. Removing a class with entries removes all its entries as well. If a class associated with a policy entry (or multiple policy entries) is removed, the corresponding entries are also removed.

The corresponding entries are only removed if the class is unused by all policy entries.

```
switch(config)# no class ip MY_IP_CLASS

switch(config)# do show class
No Class found.
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` **The class ip <CLASS-NAME> command takes you into the config-class-ipconfig-class-ip context where you enter the class entries.**	Administrators or local user group members with execution rights for this command.

class ipv6

Syntax to create an IPv6 class and enter its context. Plus syntax to remove a class:

```
class ipv6 <CLASS-NAME>
no class ipv6 <CLASS-NAME>
```

Syntax (within the class context) for creating or removing class entries for protocols `ah`, `gre`, `esp`, `igmp`, `ospf`, `pim` (`ipv6` is available as an alias for `any`):

```
  [<SEQUENCE-NUMBER>]
  {match|ignore}
  {any|ipv6|ah|gre|esp|igmp|ospf|pim|<IP-PROTOCOL-NUM>}
  {any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
  {any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
  [dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>] [ip-precedence <IP-PRECEDENCE-VALUE>]
  [tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count]

  no <SEQUENCE-NUMBER>
```

Syntax (within the class context) for creating or removing class entries for protocols `sctp`, `tcp`, `udp`:

```
  [<SEQUENCE-NUMBER>]
  {match|ignore}
  {sctp|tcp|udp}
  {any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
  [{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>]
  {any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
  [{eq|gt|lt} <PORT>|range <MIN-PORT> <MAX-PORT>]
  [urg] [ack] [psh] [rst] [syn] [fin] [established]
```

```
[dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>]  [ip-precedence <IP-PRECEDENCE-VALUE>]
[tos <TOS-VALUE>]  [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count]

no <SEQUENCE-NUMBER>
```

Syntax (within the class context) for creating or removing class entries for protocol `icmpv6`:

```
[<SEQUENCE-NUMBER>]
{permit|deny}
{icmpv6}
{any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
{any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}
[icmp-type {echo|echo-reply|<ICMP-TYPE-VALUE>}] [icmp-code <ICMP-CODE-VALUE>]
[dscp <DSCP-SPECIFIER>] [ecn <ECN-VALUE>]  [ip-precedence <IP-PRECEDENCE-VALUE>]
[tos <TOS-VALUE>] [fragment] [vlan <VLAN-ID>] [ttl <TTL-VALUE>] [count]

no <SEQUENCE-NUMBER>
```

Syntax (within the class context) for class entry comments:

```
[<SEQUENCE-NUMBER>] comment <TEXT-STRING>

no <SEQUENCE-NUMBER> comment
```

Description

Creates or modifies an IPv6 traffic class to match specified packets. Class is composed of one or more class entries ordered and prioritized by sequence numbers. With this command, each class can classify traffic based on IPv6 header information.

The **no** form of the command deletes either an IPv6 traffic class (use **no** with the class command) or an individual IPv6 traffic class entry (use **no** with the sequence number).

Parameter	Description
`ipv6`	Specifies create or modify an IPv6 class.
<CLASS-NAME>	Specifies the name of this class.
<SEQUENCE-NUMBER>	Specifies a sequence number for the class entry. Optional. Range: 1-4294967295.
`{match|ignore}`	Creates a rule to match or ignore specified packets.
<IP-PROTOCOL-NUM>	Specifies the protocol as its Internet Protocol number. For example, 2 corresponds to the IGMP protocol. Range: 0 to 255.
`{any|<SRC-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}`	Specifies the source IPv6 address. ■ **any** - specifies any source IPv6 address. ■ **<SRC-IP-ADDRESS>** - specifies the source IPv4 host address. ○ **<PREFIX-LENGTH>** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 32. ○ **<SUBNET-MASK>** - specifies the address bits to mask (dotted decimal notation).
`{any|<DST-IP-ADDRESS>[/{<PREFIX-LENGTH>|<SUBNET-MASK>}]}`	Specifies the destination IPv4 address. ■ **any** - specifies any destination IPv6 address. ■ **<DST-IP-ADDRESS>** - specifies the destination

Parameter	Description
	IPv6 host address. ◦ **<PREFIX-LENGTH>** - specifies the address bits to mask (CIDR subnet mask notation). Range: 1 to 32. ◦ **<SUBNET-MASK>** - specifies the address bits to mask (dotted decimal notation).
`[{eq|gt|lt} <PORT>|range <MIN-PORT><MAX-PORT>]`	Specifies the port or port range. Port numbers are in the range of 0 to 65535. ■ **eq <PORT>** - specifies the Layer 4 port. ■ **gt <PORT>** - specifies any Layer 4 port greater than the indicated port. ■ **lt <PORT>** - specifies any Layer 4 port less than the indicated port. ■ **range <MIN-PORT> <MAX-PORT>** - specifies the Layer 4 port range.
`cwr`	Specifies matching on the TCP Flag CWR : Congestion Window Reduced
`ece`	Specifies matching on the TCP Flag ECE : Explicit Congestion Notification [ECN]- Echo
`urg`	Specifies matching on the TCP Flag: Urgent.
`ack`	Specifies matching on the TCP Flag: Acknowledgment.
`psh`	Specifies matching on the TCP Flag: Push buffered data to receiving application.
`rst`	Specifies matching on the TCP Flag: Reset the connection.
`syn`	Specifies matching on the TCP Flag: Synchronize sequence numbers.
`fin`	Specifies matching on the TCP Flag: Finish connection.
`established`	Specifies matching on the TCP Flag: Established connection.
`dscp <DSCP-SPECIFIER>`	Specifies the Differentiated Services Code Point (DSCP), either a numeric **`<DSCP-VALUE>`** (0 to 63) or one of these keywords: ■ **AF11** - DSCP 10 (Assured Forwarding Class 1, low drop probability) ■ **AF12** - DSCP 12 (Assured Forwarding Class 1, medium drop probability) ■ **AF13** - DSCP 14 (Assured Forwarding Class 1, high drop probability)

Parameter	Description
	- **AF21** - DSCP 18 (Assured Forwarding Class 2, low drop probability) - **AF22** - DSCP 20 (Assured Forwarding Class 2, medium drop probability) - **AF23** - DSCP 22 (Assured Forwarding Class 2, high drop probability) - **AF31** - DSCP 26 (Assured Forwarding Class 3, low drop probability) - **AF32** - DSCP 28 (Assured Forwarding Class 3, medium drop probability) - **AF33** - DSCP 30 (Assured Forwarding Class 3, high drop probability) - **AF41** - DSCP 34 (Assured Forwarding Class 4, low drop probability) - **AF42** - DSCP 36 (Assured Forwarding Class 4, medium drop probability) - **AF43** - DSCP 38 (Assured Forwarding Class 4, high drop probability) - **CS0** - DSCP 0 (Class Selector 0: Default) - **CS1** - DSCP 8 (Class Selector 1: Scavenger) - **CS2** - DSCP 16 (Class Selector 2: OAM) - **CS3** - DSCP 24 (Class Selector 3: Signaling) - **CS4** - DSCP 32 (Class Selector 4: Real time) - **CS5** - DSCP 40 (Class Selector 5: Broadcast video) - **CS6** - DSCP 48 (Class Selector 6: Network control) - **CS7** - DSCP 56 (Class Selector 7) - **EF** - DSCP 46 (Expedited Forwarding)
`ecn` *`<ECN-VALUE>`*	Specifies an Explicit Congestion Notification value. Range: 0 to 3.
`ip-precedence` *`<IP-PRECEDENCE-VALUE>`*	Specifies an IP precedence value. Range: 0 to 7.
`tos` *`<TOS-VALUE>`*	Specifies the Type of Service value. Range: 0 to 31.
`fragment`	Specifies a fragment packet.
`vlan` *`<VLAN-ID>`*	Specifies VLAN tag to match on. 802.1Q VLAN ID. **NOTE:** This parameter cannot be used in any class that will be applied to a VLAN.
`ttl` *`<TTL-VALUE>`*	Specifies a time-to-live (hop limit) value. Range: 0 to 255.
`count`	Keeps the hit counts of the number of packets matching this class entry.
`[`*`<SEQUENCE-NUMBER>`*`] comment` *`<TEXT-STRING>`*	Adds a comment to a class entry. The **no** form removes only the comment from the class entry.

Usage

- If you enter an existing **<CLASS-NAME>** value, the existing class is modified with any new **<SEQUENCE-NUMBER>** value. This action creates an additional class entry. Any existing **<SEQUENCE-NUMBER>** value replaces the existing class entry with the same sequence number.
- If no sequence number is specified, a new class entry is appended to the end of the class with a sequence number equal to the highest class entry currently in the list plus 10.
- If the **<IP-PROTOCOL-NUM>** parameter is used instead of a protocol name, ensure that any needed class entry-definition parameters specific to the selected protocol are also provided.

Examples

Creating an IPv6 class with two entries:

```
switch(config)# class ipv6 MY_IPV6_CLASS
switch(config-class-ipv6)# 10 match icmpv6 any any
switch(config-class-ipv6)# 20 ignore udp any any
switch(config-class-ipv6)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
        10 match                           icmpv6
           any
           any
        20 ignore                          udp
           any
           any
```

Adding a comment to an existing IPv6 class entry:

```
switch(config)# class ipv6 MY_IPV6_CLASS
switch(config-class-ipv6)# 10 match icmpv6 any any
switch(config-class-ipv6)# 20 ignore udp any any
switch(config-class-ipv6)# 20 comment myipv6class
switch(config-class-ipv6)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
        10 match                           icmpv6
           any
           any
        20 myipv6class
           ignore                          udp
           any
           any
```

Removing a comment from an existing IPv6 class entry:

```
switch(config)# class ipv6 MY_IPV6_CLASS
switch(config-class-ipv6)# no 20 comment
switch(config-class-ipv6)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
        10 match                           icmpv6
           any
           any
        20 ignore                          udp
           any
           any

Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
        10 match                           icmpv6
           any
           any
        20 ignore                          udp
           any
           any
```

Replacing an IPv6 class entry in an existing IPv6 class:

```
switch(config)# class ipv6 MY_IPV6_CLASS
switch(config-class-ipv6)# 10 match any any 1020::
switch(config-class-ipv6)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
        10 match                           any
           any
           1020::
        20 ignore                          udp
           any
           any
```

Removing an IPv6 class entry:

```
switch(config)# class ipv6 MY_IPV6_CLASS
switch(config-class-ipv6)# no 10
switch(config-class-ipv6)# exit

switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
        20 ignore                          udp
           any
           any
```

Removing an IPv6 class. Removing a class with entries removes all its entries as well. If a class associated with a policy entry (or multiple policy entries) is removed, the corresponding entries are also removed.

The corresponding entries are only removed if the class is unused by all policy entries.

```
switch(config)# no class ipv6 MY_IPV6_CLASS

switch(config)# do show class
No Class found.
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The **class ipv6 <CLASS-NAME>** command takes you into the **config-class-ipv6** command context where you enter the class entries.	Administrators or local user group members with execution rights for this command.

class mac

class mac *<CLASS-NAME>*

```
    [<SEQUENCE-NUMBER>]
    {match|ignore}
    {any|<SRC-MAC-ADDRESS>[/<ETHERNET-MASK>}]}
    {any|<DST-MAC-ADDRESS>[/<ETHERNET-MASK>}]}
    {any|aarp|appletalk|arp|fcoe|fcoe-init|ip|ipv6|ipx-arpa|ipx-non-arpa|is-is|
          lldp|mpls-multicast|mpls-unicast|q-in-q|rbridge|trill|wake-on-lan|
          <NUMERIC-ETHERTYPE>}
    [pcp <PCP-VALUE>] [vlan <VLAN-ID>] [count]

    [<SEQUENCE-NUMBER>] comment <TEXT-STRING>
```

Description

Creates or modifies a MAC traffic class to match specified packets. Class is composed of one or more class entries ordered and prioritized by sequence numbers. With this command, each class can classify traffic based on MAC header information.

The **no** form of the command can be used to delete either a MAC traffic class (use **no** with the class command) or an individual MAC traffic class entry (use **no** with the sequence number).

Parameter	Description
`mac`	Specifies create or modify a MAC class.
`<CLASS-NAME>`	Specifies the name of this class.
`<SEQUENCE-NUMBER>`	Specifies a sequence number for the class entry. Optional. Range: 1-4294967295.
`{match|ignore}`	Creates a rule to match or ignore specified packets.
`comment`	Stores the remaining entered text as a class comment.
`{any|<SRC-MAC-ADDRESS> [/<ETHERNET-MASK>}]}`	Specifies the source host MAC address (xxxx.xxxx.xxxx), OUI, or the keyword **any**. You can optionally include the following: **<ETHERNET-MASK>** - The address bits to mask (xxxx.xxxx.xxxx).
`{any|<DST-MAC-ADDRESS> [/<ETHERNET-MASK>}]}`	Specifies the destination host MAC address (xxxx.xxxx.xxxx), OUI, or the keyword **any**. You can optionally include the following: **<ETHERNET-MASK>** - The address bits to mask (xxxx.xxxx.xxxx).
`Protocol`	Select an ethertype protocol from the following (enter one only): ▪ **any** - Any ethertype protocol ▪ **<NUMERIC-ETHERTYPE>** - Enter an EtherType protocol number. Range: 0x600-0xffff. ▪ Or enter an EtherType protocol name from the following list: ◦ **aarp** ◦ **appletalk** ◦ **arp** ◦ **fcoe** ◦ **fcoe-init** ◦ **ip** ◦ **ipv6** ◦ **ipx-arpa**

Parameter	Description
	◦ **ipx-non-arpa** ◦ **is-is** ◦ **lldp** ◦ **mpls-multicast** ◦ **mpls-unicast** ◦ **q-in-q** ◦ **rbridge** ◦ **trill** ◦ **wake-on-lan**
`pcp <PCP-VALUE>`	Not supported.
`vlan <VLAN-ID>`	Specifies matching on a VLAN ID. Enter a VLAN ID or the VLAN name, if configured. **NOTE:** This parameter cannot be used in any class that will be applied to a VLAN.
`count`	Keeps the hit counts of the number of packets matching this class entry.

Examples

Creating a MAC class:

```
switch(config)# class mac MY_MAC_CLASS
switch(config-class-mac)# match any any lldp
switch(config-class-mac)# ignore any any arp
switch(config-class-mac)# exit
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
MAC        MY_MAC_CLASS
        10 match                           lldp
           any
           any
        20 ignore                          arp
           any
           any
```

Adding a comment to an existing MAC class entry:

```
switch(config)# class mac MY_MAC_CLASS
switch(config-class-mac)# 10 comment MY_CLASS_ENTRY10 comment MY_CLASS_ENTRY
switch(config-class-mac)# exit
switch(config)# do show class
```

```
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
MAC        MY_MAC_CLASS
        10 MY_CLASS_ENTRY
           match                           lldp
           any
           any
        20 ignore                          arp
           any
           any
```

Removing a comment from an existing MAC class entry:

```
switch(config)# class mac MY_MAC_CLASS
switch(config-class-mac)# no 10 comment MY_CLASS_ENTRY
switch(config-class-mac)# exit
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
MAC        MY_MAC_CLASS
        10 match                           lldp
           any
           any
        20 ignore                          arp
           any
           any
```

Replacing a MAC class entry in an existing MAC class:

```
switch(config)# class mac MY_MAC_CLASS
switch(config-class-mac)# 10 match any any any
switch(config-class-mac)# exit
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
--------------------------------------------------------------------------------
MAC        MY_MAC_CLASS
        10 match                           any
           any
           any
        20 ignore                          arp
           any
           any
```

Removing a MAC class entry:

```
switch(config)# class mac MY_MAC_CLASS
switch(config-class-mac)# no 1
switch(config-class-mac)# exit
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_CLASS
         2 ignore                          arp
           any
           any
```

Removing a MAC class. Removing a class with entries removes all its entries as well. If a class associated with a policy entry (or multiple policy entries) is removed, the corresponding entries are also removed.

The corresponding entries are only removed if the class is unused by all policy entries.

```
switch(config)# no class mac MY_MAC_CLASS
switch(config)# do show class
No Class found.
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config` The **class mac <CLASS-NAME>** command takes you into the **config-class-mac** context where you enter the class entries.	Administrators or local user group members with execution rights for this command.

class resequence

`class {ip|ipv6|mac} <CLASS-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`

bDescription

Resequence numering in an IPv4, or IPv6, or MAC class.

Parameter	Description
{ip|ipv6|mac**}** *<CLASS-NAME>*	Specifies the class where you want to resequence class entries.
<STARTING-SEQUENCE-NUMBER>	Specifies the sequence number to start resequencing from.
<INCREMENT>	Specifies how much to increment the sequence numbers by.

Examples

Resequencing an IPv4 class:

```
switch(config)# class ip MY_IP_CLASS resequence 1 10
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv4       MY_IP_CLASS
        1  match                           igmp
           any
           any
       11  ignore                          udp
           any
           any
       21  match                           tcp
           192.168.0.1
           192.168.0.2
```

Resequencing an IPv6 class:

```
switch(config)# class ipv6 MY_IPV6_CLASS resequence 1 1
switch(config-class-ipv6)# exit
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          L3 Protocol
           Source IP Address               Source L4 Port(s)
           Destination IP Address          Destination L4 Port(s)
           Additional Parameters
-------------------------------------------------------------------------------
IPv6       MY_IPV6_CLASS
         1 match                           any
           any
           1020::
         2 ignore                          udp
           any
           any
```

Resequencing a MAC class:

```
switch(config)# class mac MY_MAC_CLASS resequence 1 1
switch(config)# do show class
Type       Name
  Sequence Comment
           Action                          EtherType
           Source MAC Address
           Destination MAC Address
           Additional Parameters
-------------------------------------------------------------------------------
MAC        MY_MAC_CLASS
         1 match                           any
           any
           any
         2 ignore                          arp
           any
           any
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

class reset

class { all | ip *<CLASS-NAME>* | ipv6 *<CLASS-NAME>* |mac *<CLASS-NAME>* } reset

Description

Changes the user-specified class configuration to match the active class configuration. Use this command when there is a discrepancy between what the user configured and what is active and accepted by the system.

Parameter	Description
{ all | ip *<CLASS-NAME>*| ipv6 *<CLASS-NAME>* |mac *<CLASS-NAME>* }	Specifies either **all** classes be reset or specifies the type (**ip** for IPv4, **ipv6** for IPv6 or **mac** for MAC ACL) and name of the class to be reset.

Examples

Resetting the user-specified configuration to the active configuration:

```
switch(config)# class all reset
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

clear policy hitcounts

```
clear policy hitcounts { all | [<POLICY-NAME>] [[interface <IF-NAME> [in|out|routed-in]]
| [vlan <VLAN-ID> [in|out]]] | global }
```

Description

Clears the policy hit count statistics.

Parameter	Description
`all`	Selects all policies.
`<POLICY-NAME>`	Specifies the policy name.
`interface` *`<IF-NAME>`*	Specifies the interface name.
`vlan` *`<VLAN-ID>`*	Specifies the VLAN.
`in`	Specifies the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction.
`routed-in`	Selects the routed in traffic direction. Not applicable to a policy applied to a VLAN.
`global`	Selects the globally applied policy.

Examples

On the 6400 Switch Series, interface identification differs.

Clearing policy hit counts and then showing the policy hit counts (statistics):

```
switch# clear policy hitcounts my_policy int 1/1/1 in
switch# show policy hitcounts my_policy
Statistics for Policy my_policy:
Interface 1/1/1* (in):
           Hit Count  Configuration
10 class ipv6 my_class1 action dscp af21 action drop
                   0  10 match any any any count
* policy statistics are shared among each context type (interface, VLAN).
  For routed ingress, they are only shared within the same VRF.
  Use 'policy NAME copy' to create a new policy for separate statistics.
```

Clearing the globally applied policy hit counts and then showing the global policy hit counts (statistics):

```
switch# clear policy hitcounts global
switch# show policy hitcounts global
Statistics for Policy global1:
Global Policy:
           Hit Count  Configuration
10 class ipv6 my_class1 action mirror
                   0  10 match any any any count
* policy statistics are shared among each context type (interface, VLAN).
  For routed ingress, they are only shared within the same VRF.
  Use 'policy NAME copy' to create a new policy for separate statistics.
```

Clearing hit counts for policy **MY_IPv6_Policy** applied to VLAN 10 (ingress):

```
switch# clear policy hitcounts My_IPv6_Policy vlan 10 in
```

Clearing hit counts for all policies:

```
switch# clear policy hitcounts all
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

policy

```
policy <POLICY-NAME>

    [<SEQUENCE-NUMBER>]
    class {ip|ipv6|mac} <CLASS-NAME>
          action {<REMARK-ACTIONS> | <POLICE-ACTIONS> | <OTHER-ACTIONS>}
          [{<REMARK-ACTIONS> | <POLICE-ACTIONS> | <OTHER-ACTIONS>}]

    [<SEQUENCE-NUMBER>]
    comment ...
```

Description

Creates or modifies classifier policy and policy entries. A policy is made up of one or more policy entries ordered and prioritized by sequence numbers. Each entry has an IPv4/IPv6/MAC class and zero or more policy actions associated with it.

A policy must be applied using the **apply** command.

The **no** form of the command can be used to delete either a policy (use **no** with the policy command) or an individual policy entry (use **no** with the sequence number).

Parameter	Description
`<POLICY-NAME>`	Specifies the name of the policy.
`<SEQUENCE-NUMBER>`	Specifies a sequence number for the policy entry. Optional. Range: 1 to 4294967295.
`comment`	Stores the remaining entered text as a policy entry comment.
`class {ip|ipv6|mac} <CLASS-NAME>`	Specifies a type of class, **ip** for IPv4, **ipv6** for IPv6 and **mac** for a MAC policy. And specifies a class name.
`<REMARK-ACTIONS>`	Remark actions can be any of the following options: {pcp **<PRIORITY>** | **ip-precedence <IP-PRECEDENCE_VALUE> | dscp <*DSCP-VALUE*> | local-priority <*LOCAL-PRIORITY-VALUE*>**} where:
`pcp <PCP-VALUE>`	Specifies the Priority Code Point (PCP) value. Range: 0 to 7.
`ip-precedence <IP-PRECEDENCE-VALUE>`	Specifies the numeric IP precedence value. Range: 0 to 7.
`dscp <DSCP-VALUE>`	Specifies a Differentiated Services Code Point (DSCP) value. Enter either a numeric value (0 to 63) or a keyword as follows: ▪ **AF11** - DSCP 10 (Assured Forwarding Class 1, low drop probability) ▪ ▪ **AF12** - DSCP 12 (Assured Forwarding Class 1, medium drop probability) ▪ **AF13** - DSCP 14 (Assured Forwarding Class 1, high drop probability) ▪ **AF21** - DSCP 18 (Assured Forwarding Class 2, low drop probability)

Parameter	Description
	- **AF22** - DSCP 20 (Assured Forwarding Class 2, medium drop probability) - **AF23** - DSCP 22 (Assured Forwarding Class 2, high drop probability) - **AF31** - DSCP 26 (Assured Forwarding Class 3, low drop probability) - **AF32** - DSCP 28 (Assured Forwarding Class 3, medium drop probability) - **AF33** - DSCP 30 (Assured Forwarding Class 3, high drop probability) - **AF41** - DSCP 34 (Assured Forwarding Class 4, low drop probability) - **AF42** - DSCP 36 (Assured Forwarding Class 4, medium drop probability) - **AF43** - DSCP 38 (Assured Forwarding Class 4, high drop probability) - **CS0** - DSCP 0 (Class Selector 0: Default) - **CS1** - DSCP 8 (Class Selector 1: Scavenger) - **CS2** - DSCP 16 (Class Selector 2: OAM) - **CS3** - DSCP 24 (Class Selector 3: Signaling) - **CS4** - DSCP 32 (Class Selector 4: Real time) - **CS5** - DSCP 40 (Class Selector 5: Broadcast video) - **CS6** - DSCP 48 (Class Selector 6: Network control) - **CS7** - DSCP 56 (Class Selector 7) - **EF** - DSCP 46 (Expedited Forwarding)
`local-priority` *`<LOCAL-PRIORITY-VALUE>`*	Specifies a local priority value. Range: 0 to 7.
`<POLICE-ACTIONS>`	Police actions can be the following **{cir <*RATE-BPS*>cbs <BYTES> exceed}** where:
`cir kbps` *`<RATE-KBPS>`*	Specifies a Committed Information Rate value in Kilobits per second. Range: 1 to 4294967295.
`cbs` *`<BYTES>`*	Specifies a Committed Burst Size value in bytes. Range: 1 to 4294967295.
`exceed`	Specifies action to take on packets that exceed the rate limit.
`<OTHER-ACTIONS>`	Other actions can be the following:
`drop`	Specifies drop traffic.

Usage

- An applied policy will process a packet sequentially against policy entries in the list until the last policy entry in the list has been evaluated or the packet matches an entry.
- Entering an existing **`<POLICY-NAME>`** value will cause the existing policy to be modified, with any new **`<SEQUENCE-NUMBER>`** value creating an additional policy entry, and any existing **`<SEQUENCE-NUMBER>`** value replacing the existing policy entry with the same sequence number.

- If no sequence number is specified, a new policy entry will be appended to the end of the entry list with a sequence number equal to the highest policy entry currently in the list plus 10.

Examples

Creating a policy with several entries:

```
switch(config)# policy MY_POLICY
switch(config-policy)# 10 class ipv6 MY_CLASS1 action dscp af21 action drop
switch(config-policy)# 20 class ip MY_CLASS3 action mirror 1
switch(config-policy)# exit
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
--------------------------------------------------------------------------------
           MY_POLICY
        10
           MY_CLASS1 ipv6
                    drop
                    dscp AF21

        20
           MY_CLASS3 ipv4
                    mirror 1
```

Adding a comment to an existing policy entry:

```
switch(config)# policy MY_POLICY
switch(config-policy)# 20 comment MY_TEST_POLICY
switch(config-policy)# exit
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
--------------------------------------------------------------------------------
           MY_POLICY
        10
           MY_CLASS1 ipv6
                    drop
                    dscp AF21

        20 MY_TEST_POLICY
           MY_CLASS3 ipv4
                    mirror 1
```

Removing a comment from an existing policy entry:

```
switch(config)# policy MY_POLICY
switch(config-policy)# no 20 comment
switch(config-policy)# exit
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
```

```
--------------------------------------------------------------------------------
           MY_POLICY
        10
           MY_CLASS1 ipv6
                    drop
                    dscp AF21

        20
           MY_CLASS3 ipv4
                    mirror 1
```

Adding/Replacing a policy entry in an existing policy:

```
switch(config)# policy MY_POLICY
switch(config-policy)# 10 class ip MY_CLASS3 action drop action dscp af21
switch(config-policy)# exit
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
--------------------------------------------------------------------------------
           MY_POLICY
        10
           MY_CLASS3 ipv4
                    drop
                    dscp AF21

        20
           MY_CLASS3 ipv4
                    mirror 1
```

Removing a policy entry:

```
switch(config)# policy MY_POLICY
switch(config-policy)# no 10
switch(config-policy)# exit
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
--------------------------------------------------------------------------------
           MY_POLICY
        20
           MY_CLASS3 ipv4
                    mirror 1
```

Removing a policy:

```
switch(config)# no policy MY_POLICY
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
```

```
-------------------------------------------------------------------------------
           MY_POLICY2
         2
           MY_CLASS3 ipv4
                    mirror 1
```

The policer **exceed** DSCP action cannot be combined with other actions in the same policy entry, but other entries in the policy may use other actions.

For example, this configuration is valid:

```
switch(config)# policy my_policy
switch(config-policy)# 10 class ip my_class action cir kbps 1000 cbs 15625 exceed
dscp EF
```

But this is not because it adds a secondary action within the same policy entry:

```
6300(config-policy)# 10 class ip my_class action cir kbps 1000 cbs 15625 exceed
dscp EF action mirror 1
```

Invalid input: action

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` The `policy` command takes you into the `config-policy` context where you enter the policy entries.	Administrators or local user group members with execution rights for this command.

policy copy

policy *<POLICY-NAME>* copy *<DESTINATION-POLICY>*

Description

Copies a policy to a new destination policy or overwrites an existing policy. Copying a policy copies all its entries as well.

Parameter	Description
<POLICY-NAME>	Specifies the policy to be copied.
<DESTINATION-POLICY>	Specifies the name of the destination policy.

Examples

Copying a policy:

```
switch(config)# policy MY_POLICY copy MY_POLICY2
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
-------------------------------------------------------------------------------
           MY_POLICY
         2
           my_class3 ipv4
                    mirror 1
-------------------------------------------------------------------------------
           MY_POLICY2
         2
           my_class3 ipv4
                    mirror 1
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

policy resequence

policy *<POLICY-NAME>* resequence *<STARTING-SEQ-NUM>* *<INCREMENT>*

Description

Resequences numbering in a policy.

Parameter	Description
<POLICY-NAME>	Specifies the policy where you want to resequence policy entries.
<STARTING-SEQ-NUM>	Specifies the sequence number to start resequencing from.
<INCREMENT>	Specifies how much to increment the sequence numbers by.

Examples

Resequencing a policy:

```
switch(config)# policy MY_POLICY resequence 1 1
switch(config)# do show policy
           Name
  Sequence Comment
           Class Type
                    action
-------------------------------------------------------------------------------
           MY_POLICY
         1
           MY_CLASS3 ipv4
                    drop
                    dscp AF21

         2
           MY_CLASS3 ipv4
                    mirror 1
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

policy reset

`policy <POLICY-NAME> reset`

Description

Changes the user-specified policy configuration to match the active policy configuration. Use this command when a discrepancy exists between what the user configured and what is active and accepted by the system.

Parameter	Description
<POLICY-NAME>	Specifies the policy to be reset.

Examples

Resetting a policy:

```
switch(config)# policy MY_POLICY reset
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show class

```
show class [ip | ipv6 | mac] [<CLASS-NAME>] [commands] [configuration] [vsx-peer]
```

Description

Shows class configuration information.

All parameters are optional.

Parameter	Description
`[ip | ipv6 | mac]`	Selects the class type for the display: **ip** for IPv4, **ipv6** for IPv6, or **mac** for MAC classes.
<CLASS-NAME>	Specifies the class name.
`commands`	Specifies whether to display output as the CLI commands showing the configured class entries.
`configuration`	Specifies whether to display classes that have been configured by

Parameter	Description
	the user, even if they are not active due to issues with the command parameters or hardware issues. This parameter is useful during a mismatch between the entered configuration and the previous successfully programmed (active) classes.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing all class configuration:

```
switch# show class
Type Name
    Sequence Comment
           action                      L3 Protocol
           Source IP address           Source L4 Port(s)
           Destination IP address      Destination L4 Port(s)
           Additional Parameters
---------------------------------------------------------------
ipv4 MY_IPV4_CLASS
        10 my first class entry comment
           match                       icmp
           192.168.0.1/255.255.255.0
           192.168.1.1/255.255.255.0
           VLAN: 1
        20 my second class entry comment
           ignore                      tcp
           10.100.0.10/255.255.255.0   < 3000
           10.100.1.10/255.255.255.0   > 2000
           VLAN: 1
----------------------------------------------------------------------
```

Showing class configuration for the IPv4 class MY_IPV4_CLASS as CLI commands:

```
switch# show class ip MY_IPV4_CLASS commands
class ip "MY_IPV4_CLASS"
  10 match icmp 192.168.0.1/255.255.255.0 192.168.1.1/255.255.255.0 vlan 1
  10 comment my first class entry comment
  20 ignore tcp 10.100.0.10/255.255.255.0 lt 3000 10.100.1.10/255.255.255.0 gt
     2000 vlan 1
  20 comment my second class entry comment
```

For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show policy

Syntax that shows information for all policies:

```
show policy [commands] [configuration] [vsx-peer]
```

Syntax that filters by policies applied to an interface or VLAN:

```
show policy [interface <IF-NAME> [in | out | routed-in] | vlan <VLAN-ID> [in | out] | vni
<VNI-ID> [routed-in]]
            [commands] [configuration] [vsx-peer]
show policy [interface <IF-NAME> [in | routed-in] | vlan <VLAN-ID> [in] | vni <VNI-ID>
[routed-in]]
            [commands] [configuration] [vsx-peer]
```

Syntax that filters by the named policy:

```
show policy <POLICY-NAME> [commands] [configuration] [vsx-peer]
```

Syntax that filters by the globally applied policy:

```
show policy global [commands] [configuration] [vsx-peer]
```

Syntax that shows statistical information in the form of hit counts:

```
show policy hitcounts <POLICY-NAME> [interface <IF-NAME> [in | out | routed-in] |
                      vlan <VLAN-ID> [in | out] | vni <VNI-ID> [routed-in]] [vsx-peer]
```

Syntax that shows statistical information in the form of hit counts for the globally applied policy:

```
show policy hitcounts global [vsx-peer]
```

Description

Shows information about your defined policies and where they have been applied. When **show policy** is entered without parameters, information for all policies is shown. The parameters filter the list of policies for which information is shown.

Available filtering includes:

- The content of a specific policy.
- All policies applied to a specific interface.
- All policies applied to a specific VLAN.
- All policies applied to a specific VNI.
- The globally applied policy.
- The inbound (ingress) or outbound (egress) direction.

To display policy statistics, use the **show policy hitcounts** form of this command.

When a policy is applied to a physical interface or lag using command **apply policy**, with the **per-interface** parameter included, unique instances of the policy are applied to each physical interface port or LAG. The unique instance of a policy has a parent-child relationship with the policy from which it was created. The **show policy** command shows information about the parent policy not the unique instances.

If a policy contains any class entries with the count keyword and policy entries with the **cir** action, and the policy is applied to multiple physical or virtual interfaces in the same direction, except for the routed ingress direction, the statistics will be aggregated. In the routed ingress direction, the statistics will be aggregated in multiple physical or virtual interfaces in the same VRF. If separate statistics for different physical or virtual interfaces are required, then another policy should be created. Alternatively, in the case of physical interfaces or LAGs, a policy applied with **per-interface** set can be used.

Parameter	Description
`interface <IF-NAME>`	Specifies the interface name.
`vlan <VLAN-ID>`	Specifies the VLAN.
`vni<VNI-ID>`	Specifies the VNI.
`in`	Selects the inbound (ingress) traffic direction.
`out`	Selects the outbound (egress) traffic direction.
`routed-in`	Selects the routed in traffic direction. Not applicable to a policy applied to a VLAN.
`<POLICY-NAME>`	Specifies the policy name.
`commands`	Causes the policy definition to be shown as the commands and parameters used to create it rather than in tabular form.
`configuration`	Causes the user-configured policies be shown as entered, even if the policies are not active due to policy-definition command issues or hardware issues. This parameter is useful if there is a mismatch between the entered configuration and the previous successfully programmed (active) policies configuration.
`global`	Selects the globally applied policy.
`hitcounts`	Selects the policy hit counts (statistics).
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for all policies:

```
switch# show policy
           Name
  Sequence Comment
           Class Type
                    action
-------------------------------------------------------------------------------
           my_policy
        10 QOS class
           class1 ipv4
```

```
                    dscp af21
                    drop
        20 PBR policy.
           class2 ipv4
                    pbr mypbr
-------------------------------------------------------------------------------
```

Showing a policy as commands:

```
switch# show policy commands
policy my_policy
       10 class ip class1 action dscp af21 action drop
       20 class ip class2 action pbr mypbr
```

Showing the globally applied policy:

```
switch# show policy global commands
policy global1
    10 class ip my_class1 action drop
apply policy my_policy in
```

Showing policy hit counts (statistics) for the globally applied policy:

```
switch# show policy hitcounts global
Statistics for Policy My_Policy:
global (in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count
```

Showing policy hit counts (statistics) for a policy applied everywhere (with 1/1/4 and 1/1/5 being applied per interface):

```
switch# show policy hitcounts My_Policy
Statistics for Policy My_Policy:

Interface 1/1/1,lag1 (in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count

Interface 1/1/4 (in):
     Matched Packets  Configuration
```

```
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count

Interface 1/1/5 (in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count

interface 1/1/2.10,1/1/3.10 (in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count
...
```

Showing policy hit counts (statistics) for a policy applied on physical interfaces and LAGs:

```
switch# show policy hitcounts My_Policy interface 1/1/1
Statistics for Policy My_Policy:

Interface 1/1/1,lag1 (in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count
```

Showing policy hit counts (statistics) for a policy applied on VLANs:

```
switch# show policy hitcounts My_Policy vlan 10
Statistics for Policy My_Policy:

vlan 10,20-30 (in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
```

```
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count
Statistics for Policy My_Policy:

vlan 10,20-30 (in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count
```

Showing policy hit counts (statistics) for a policy applied on interface VLANs:

```
switch# show policy hitcounts My_Policy interface vlan10
Statistics for Policy My_Policy:

VRF red
interface vlan 10,30 (routed-in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count
```

```
show policy hitcounts My_Policy vni 1000
Statistics for Policy My_Policy:
vni 1000 (routed-in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop
                   0  10 match tcp any any count [ 0 kbps conform ]
                   0  20 match icmpv6 1000::10 any count [ 0 kbps conform ]show
policy hitcounts My_Policy vni 1000
Statistics for Policy My_Policy:
vni 1000 (routed-in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop
                   0  10 match tcp any any count [ 0 kbps conform ]
                   0  20 match icmpv6 1000::10 any count [ 0 kbps conform ]
```

Showing policy hit counts (statistics) for a policy applied on interface VLANs for a specific VRF:

```
switch# show policy hitcounts My_Policy vrf green routed-in
Statistics for Policy My_Policy:

VRF green
interface vlan 20,25 (routed-in):
     Matched Packets  Configuration
10 class ip My_ip_Class
                   0  10 match tcp any any ack count
                   -  20 match udp any lt 8 any
                   0  30 match icmp any 10.1.1.10 count
20 class ipv6 My_ipv6_Class action cir kbps 1000000 cbs 1000000 exceed drop  [ 0
kbps conform ]
                   -  10 match tcp any any ack
                   0  20 match icmpv6 1000::10 any count
```

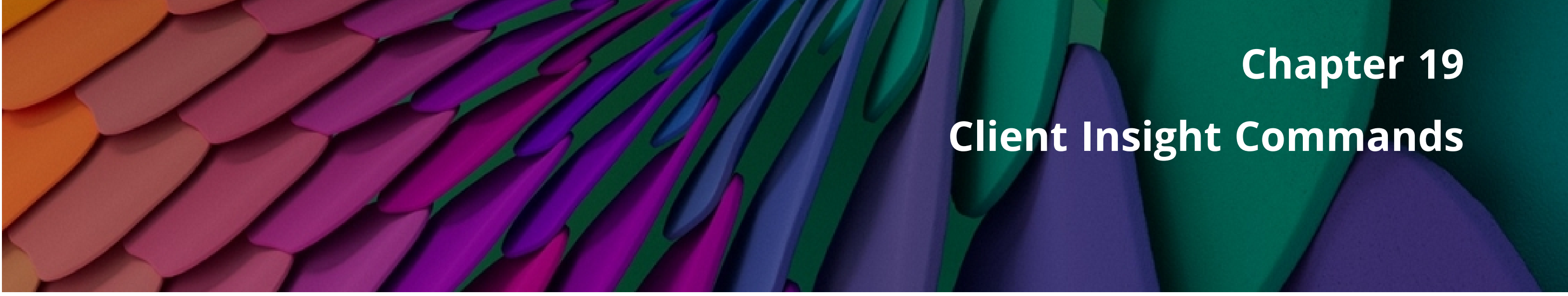
For more information on features that use this command, refer to the ACLs and Classifiers Policy Guide for your switch model.

Command History

Release	Modification
10.08	Added **[per-interface]** information. Updated examples.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 19

Client Insight Commands

client-insight enable

```
client-insight enable
no client-insight enable
```

Description

Enables the Client Insight feature on the device. Client Insight is disabled by default at the device level.

The `no` form of the command disables Client Insight.

Examples

Enabling the Client Insight feature:

```
switch(config)# client-insight enable
```

Disabling the Client Insight feature:

```
switch(config)# no client-insight enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

client-insight on-boarding event logs

```
client-insight
   event-log
   client-onboarding
```

Description

Enables generation of event logs that lists the onboarding status of each client. Onboarding event logs are disabled by default. For onboarding event logs to work, the Client Insight feature should be enabled before client onboarding. Use the no form of the command to disable onboarding event logs for clients.

Parameter	Description
`event-log`	Configure client onboarding event logs.
`client-onboarding`	Enable client onboarding event logs.

Examples

Enabling client onboarding event logs:

```
switch(config)# client-insight event-log client-onboarding
```

Disabling client onboarding event logs:

```
switch(config)# no client-insight event-log client-onboarding
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

diag-dump client-insight basic

`diag-dump client-insight basic`

Description

Displays the status of the Client Insight feature—whether enabled or disabled globally. It also displays latencies for all active clients that are onboarded.

Examples

```
switch# diag-dump client-in basic
=========================================================================
[Start] Feature client-insight Time : Tue Jul 25 05:32:14 2023
```

```
=========================================================================
-------------------------------------------------------------------------
[Start] Daemon client-insightd
-------------------------------------------------------------------------

Global client-insight         = ENABLED
Client on-boarding event logs = ENABLED
Client dns on-boarding latency= ENABLED

Displaying client entries with (mac) as key.
Total number of entries: 2

MAC : 00:50:56:96:0e:3f
-----------------------
Overall on-boarding status         : successful
Overall on-boarding failure reason : -

L2 on-boarding detail
---------------------
L2 on-boarding status         : successful
L2 on-boarding failure reason : -
L2 on-boarding start time     : 07/25/2023 05:28:50.495425 UTC
L2 on-boarding end time       : 07/25/2023 05:28:50.495425 UTC
L2 on-boarding latency        : 0 min, 0 sec, 0 us
802.1x RADIUS latency         : -
MAC-Auth RADIUS latency       : -

L3 on-boarding detail
----------------------
IP on-boarding status           : successful
IP on-boarding failure reason   : -
L3 on-boarding latency          : 0 min, 3 sec, 455792 us

VLAN : 20
-----------
IP details
----------
IPv4 on-boarding status         : successful
IPv6 on-boarding status         : -

DHCPv4                                           DHCPv6
------                                           ------
Status         : successful                      Status         : -
Failure reason : -                               Failure reason : -
Start time     : 07/25/2023 05:28:50.485325 UTC  Start time     : -
End time       : 07/25/2023 05:28:53.941117 UTC  End time       : -

DNS details
-----------
DNS on-boarding status : successful
Failure reason         : -

Server IP: 11.11.11.2
---------------------
On-boarding latency  : 0 min, 0 sec, 306 us
DNS request time     : 07/25/2023 05:28:59.656937 UTC
DNS response time    : 07/25/2023 05:28:59.657243 UTC

Average latency:
Server IP: 11.11.11.2
---------------------
Average latency                        : 7091960 usec
```

```
DNS start time for latency calculation : 07/25/2023 05:23:51.335296 UTC
DNS end time for latency calculation   : 07/25/2023 05:28:51.323025 UTC
Number of DNS requests                 : 14

Server IP: 12.12.12.2
---------------------
Average latency                        : 7954 usec
DNS start time for latency calculation : 07/25/2023 05:23:51.335296 UTC
DNS end time for latency calculation   : 07/25/2023 05:28:51.323025 UTC
Number of DNS requests                 : 12

Server IP: 13.13.13.2
---------------------
Average latency                        : 7388 usec
DNS start time for latency calculation : 07/25/2023 05:23:51.335296 UTC
DNS end time for latency calculation   : 07/25/2023 05:28:51.323025 UTC
Number of DNS requests                 : 12
-------------------------------------------------------------------------
[End] Daemon client-insightd
-------------------------------------------------------------------------
=========================================================================
[End] Feature client-insight
=========================================================================
Diagnostic-dump captured for feature client-insight
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show capacities client-insight-client-limit

```
show capacities client-insight-client-limit
```

Description

Displays the maximum number of clients supported by the Client Insight feature on the switch.

Examples

```
switch# show capacities client-insight-client-limit

System Capacities: Filter Client-Insight client limit
```

```
Capacities Name                                                    Value
------------------------------------------------------------------------
Maximum number of clients supported by Client-Insight feature       4096
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show capacities-status client-insight-client-limit

```
show capacities-status client-insight-client-limit
```

Description

Displays the maximum number of clients learnt by the Client Insight feature on the switch.

Examples

```
switch# show capacities-status client-insight-client-limit
System Capacities Status: Filter Client-Insight client limit
Capacities Status Name                                      Value Maximum
------------------------------------------------------------
Number of clients learnt by Client-Insight feature              0    4096
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show events -c client-insight

```
show events -c client-insight
```

Description

Displays all the events logged by the Client Insight feature.

Following events are logged by the Client Insight feature:

Table 1: *Events Logged by Client Insight*

Process	Event ID	Severity	Message	Description
client-insightd	14301	Info	`Client {mac} {vlans} on {port_name} successfully on-boarded. Client on-boarding started at {ob_start_ts}; L2 complete at {l2_end_ts}; L3 complete at {l3_end_ts}`	Client successfully on-boarded with given timestamp values.
client-insightd	14302	Info	`Client {mac} {vlans} on {port_name} partial success in on-boarding. L2 status: {l2_ob_state} L3 status: {l3_ob_state}. Client on-boarding started at {ob_start_ts};L2 complete at {l2_end_ts}; L3 complete at {l3_end_ts}`	Client on-boarding is partial-successful with given timestamp values.
client-insightd	14303	Info	`Client {mac} on {port_name} failed to on-board with status: {onboarding_status} reason_code: {failure_phase_id}`	Client failed to on-board with given status and reason code.
client-insightd	14304	Info	`Maximum system wide client limit {client-number} reached`	Maximum system wide client limit is reached
client-insightd	14305	Info	`Maximum system wide client`	Maxiumum system wide client limit is reached

Process	Event ID	Severity	Message	Description
			`limit {client-number} reached`	
client-insightd	14306	Info	`Client {mac} successfully on-boarded on VLAN {vlans}; Client on-boarding started at {ob_start_ts}; L2 complete at {l2_end_ts}; L3 complete at {l3_end_ts}; ARP to GW response received at {arp_end_ts}; DNS on-boarding to (dns_server_ip) completed at {dns_end_ts}`	Client successfully on-boarded with given timestamp values.
client-insightd	14307	Info	`Client {mac} on-boarded on VLANs {vlans} and failed on VLANs {failed_vlans}; Client on-boarding started at {ob_start_ts}; L2 complete at {l2_end_ts}; L3 complete at {l3_end_ts}; ARP to GW response received at {arp_end_ts}; DNS on-boarding to (dns_server_ip) completed at {dns_end_ts}; L2 status {l2_ob_state} failure_reason_code - {l2_failure_reason}; L3 status {l3_ob_state} failure_reason_code - {l3_failure_reason}; DNS on-boarding status {dns_status} failure_reason_code - {dns_failure_reason}`	Client on-boarding is partial-successful with given timestamp values.
client-insightd	14308	Info	`Client {mac} failed to on-board with status: {onboarding_status} in failure phase: {failure_phase_id} with reason: {failure_reason}`	Client failed to on-board with given status, phase_id and reason code.

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show tech client-insight

`show tech client-insight`

Description

Displays if the global Client Insight and client on-boarding event log features are enabled or disabled. Also displays the latencies for all active clients that are onboarded.

Examples

```
switch# show tech client-insight

====================================================
Show Tech executed on Thu May 18 15:05:43 2022
====================================================
====================================================
[Begin] Feature client-insight
====================================================
*********************************
Command : show client-insight
*********************************
Client Insight Information:
Global client-insight         = ENABLED
Client on-boarding event logs = ENABLED
====================================================
[End] Feature client-insight
====================================================
====================================================
Show Tech commands executed successfully
====================================================
```

Displaying L2, L3 client latencies and details:

```
switch# show tech client-insight
====================================================
Show Tech executed on Thu Sep 22 06:34:16 2022
====================================================
====================================================
[Begin] Feature client-insight
====================================================


*********************************
Command : diag-dump client-insight basic
*********************************
=========================================================================
[Start] Feature client-insight Time : Thu Sep 22 06:34:16 2022
=========================================================================
-------------------------------------------------------------------------
[Start] Daemon client-insightd
-------------------------------------------------------------------------

    Global client-insight         = ENABLED
    Client on-boarding event logs = ENABLED

  Displaying client entries with (mac) as key.
  Total number of entries: 1

MAC : 00:11:01:00:00:08
-----------------------
  Overall on-boarding status         : -
  Overall on-boarding failure reason : -

  L2 on-boarding detail
  ---------------------
    L2 on-boarding status          : successful
    L2 on-boarding failure reason : -
    L2 authentication start time  : 05/18/22 15:01:01.456789 UTC
    L2 authentication end time    : 05/18/22 15:01:02.123456 UTC
    L2 authentication latency     : 0 min, 0 sec, 666667 us
    802.1x RADIUS latency         : -
    MAC-Auth RADIUS latency       : 0 min, 0 sec, 332456 us

  L3 on-boarding detail
  ----------------------
    L3 on-boarding status           : in_progress
    L3 on-boarding failure reason   : -
    L3 on-boarding latency          : -

    VLAN : 10
    -----------
      IP details
      ----------
        IPv4 on-boarding status         : successful
        IPv6 on-boarding status         : -

        DHCPv4                                           DHCPv6
        ------                                           ------
          Status         : successful                      Status         : -
          Failure reason : -                               Failure reason : -
          Start time     : 05/18/22 15:01:02.456789 UTC    Start time     : -
          End time       : 05/18/22 15:01:02.999988 UTC    End time       : -

    VLAN : 20
    -----------
      IP details
      ----------
        IPv4 on-boarding status         : In_Progress
        IPv6 on-boarding status         : -
        DHCPv4                                           DHCPv6
        ------                                           ------
          Status         : In_Progress                     Status         : -
          Failure reason : -                               Failure reason : -
          Start time     : 05/18/22 15:01:03.256485 UTC    Start time     : -
          End time       : -                               End time       : -

  DNS details
  -----------
    Server IP: 172.16.1.8
    ---------------------
      Average latency                       : 0 min, 0 sec, 432456 us
      DNS start time for latency calculation : 05/18/22 15:01:03.123456 UTC
      DNS end time for latency calculation   : 05/18/22 15:01:03.425466 UTC
      Number of DNS requests                 : 16

   Server IP: 2003::1
   ---------------------
      Average latency                       : 0 min, 0 sec, 432456 us
      DNS start time for latency calculation : 05/18/22 15:01:03.123456 UTC
      DNS end time for latency calculation   : 05/18/22 15:01:03.425466 UTC
      Number of DNS requests                 : 16




-------------------------------------------------------------------------
[End] Daemon client-insightd
-------------------------------------------------------------------------
=========================================================================
[End] Feature client-insight
=========================================================================
Diagnostic-dump captured for feature client-insight
====================================================
[End] Feature client-insight
====================================================


====================================================
Show Tech commands executed successfully
====================================================
Show Tech took 43 seconds for execution

====================================================
Show Tech executed on Thu Sep 22 06:34:16 2022
====================================================
====================================================
[Begin] Feature client-insight
====================================================


*********************************
Command : diag-dump client-insight basic
*********************************
=========================================================================
[Start] Feature client-insight Time : Thu Sep 22 06:34:16 2022
=========================================================================
-------------------------------------------------------------------------
[Start] Daemon client-insightd
-------------------------------------------------------------------------
```

```
    Global client-insight         = ENABLED
    Client on-boarding event logs = ENABLED

  Displaying client entries with (mac) as key.
  Total number of entries: 1

MAC : 00:11:01:00:00:08
-----------------------
  Overall on-boarding status         : -
  Overall on-boarding failure reason : -

  L2 on-boarding detail
  ---------------------
    L2 on-boarding status         : successful
    L2 on-boarding failure reason : -
    L2 authentication start time  : 05/18/22 15:01:01.456789 UTC
    L2 authentication end time    : 05/18/22 15:01:02.123456 UTC
    L2 authentication latency     : 0 min, 0 sec, 666667 us
    802.1x RADIUS latency         : -
    MAC-Auth RADIUS latency       : 0 min, 0 sec, 332456 us

  L3 on-boarding detail
  ----------------------
    L3 on-boarding status           : in_progress
    L3 on-boarding failure reason   : -
    L3 on-boarding latency          : -

    VLAN : 10
    -----------
      IP details
      ----------
        IPv4 on-boarding status         : successful
        IPv6 on-boarding status         : -

        DHCPv4                                           DHCPv6
        ------                                           ------
          Status         : successful                      Status         : -
          Failure reason : -                               Failure reason : -
          Start time     : 05/18/22 15:01:02.456789 UTC    Start time     : -
          End time       : 05/18/22 15:01:02.999988 UTC    End time       : -

    VLAN : 20
    -----------
      IP details
      ----------
        IPv4 on-boarding status         : In_Progress
        IPv6 on-boarding status         : -

        DHCPv4                                           DHCPv6
        ------                                           ------
          Status         : In_Progress                     Status         : -
          Failure reason : -                               Failure reason : -
          Start time     : 05/18/22 15:01:03.256485 UTC    Start time     : -
          End time       : -                               End time       : -

  DNS details
  -----------
    Server IP: 172.16.1.8
    ---------------------
      Average latency                        : 0 min, 0 sec, 432456 us
      DNS start time for latency calculation : 05/18/22 15:01:03.123456 UTC
      DNS end time for latency calculation   : 05/18/22 15:01:03.425466 UTC
      Number of DNS requests                 : 16

   Server IP: 2003::1
   ---------------------
      Average latency                        : 0 min, 0 sec, 432456 us
      DNS start time for latency calculation : 05/18/22 15:01:03.123456 UTC
      DNS end time for latency calculation   : 05/18/22 15:01:03.425466 UTC
      Number of DNS requests                 : 16




-------------------------------------------------------------------------
[End] Daemon client-insightd
-------------------------------------------------------------------------
=========================================================================
[End] Feature client-insight
=========================================================================
Diagnostic-dump captured for feature client-insight
====================================================
[End] Feature client-insight
====================================================


====================================================
Show Tech commands executed successfully
====================================================
Show Tech took 43 seconds for execution
```

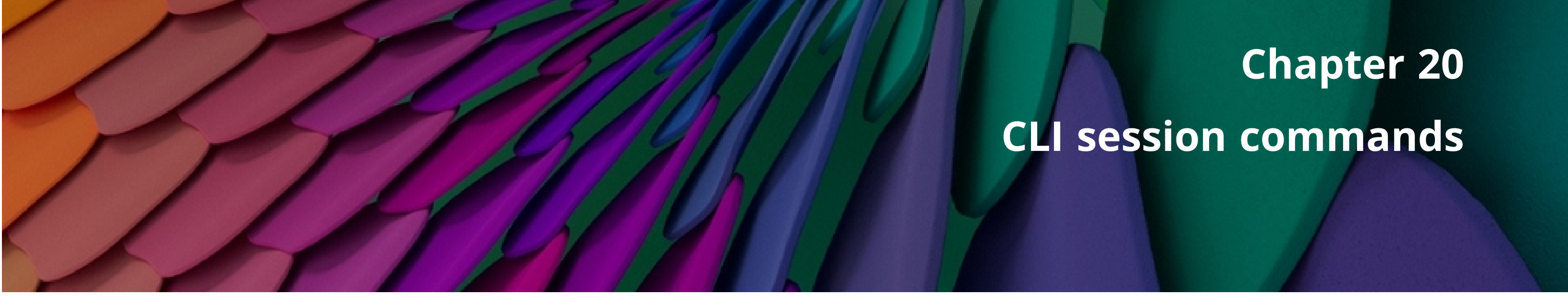
For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 20

CLI session commands

alias

```
alias <ALIAS-NAME> <COMMAND-STRING>
no alias <ALIAS-NAME><COMMAND-STRING>
```

Description

Defines an alias for one or more CLI commands. The alias and its definition are valid only for the user that creates the alias. The alias name cannot be an existing token name.

The alias command should not be configured for CLI commands that contain sensitive information.

The **no** form of this command removes the specified alias.

Parameter	Description
<ALIAS-NAME>	Specifies the name of the alias you are defining.
<COMMAND-STRING>	Specifies one or more commands and their parameters. Separate commands with a semicolon (;). Length: 1 to 400 characters. For commands that require user-supplied parameters, use **$1** through $*n*, in order, as placeholders. These parameters are replaced by the corresponding arguments from the command line, and must match the number of parameters required by the original command. For alias definitions that include multiple commands, continue numbering parameters through all commands. Do not restart numbering for each command.

Examples

Defining an alias:

```
switch(config)# alias srci show running-config interface $1
switch(config)# srci?
  shv  Execute "show alias" to list the command list. Arguments to replace $1,
       $2 etc.
switch(config)# show alias
  Alias Name                     Alias Definition
  -------------------------------------------------------------------------------
  srci                           show running-config interface $1
```

Using **alias** in config context:

```
switch(config)# srci 1/1/1
interface 1/1/1
    no shutdown
```

```
  ip address 1.1.1.1/24
  exit
```

Using **alias** in enable context:

```
switch# srci 1/1/1
interface 1/1/1
    no shutdown
    ip address 1.1.1.1/24
    exit
```

Using **alias** in operator context:

```
switch> srci 1/1/1
interface 1/1/1
    no shutdown
    ip address 1.1.1.1/24
    exit
```

Removing an alias:

```
switch(config)# no alias srci show running-config interface $1
switch(config)# show alias
  Alias Name                     Alias Definition
  --------------------------------------------------------------------------------
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

auto-confirm

```
auto-confirm
no auto-confirm
```

Description

Specifies that the CLI automatically enters the affirmative response (**y**) to all confirmation prompts, enabling commands to execute without waiting for user confirmation.

The **no** form of this command sets auto-confirmation to the default value disabled.

Usage

Some commands, such as **boot** command, prompt to confirm execution of the command or to save the current configuration. Typically, such commands display a confirmation message similar to the following:

```
Continue (y/n)?
```

This command is useful for automating switch configuration, but Hewlett Packard Enterprise recommends that you use the REST API instead of using CLI scripts to automate configuration operations.

When the switch reboots, auto-confirmation is set to the default (disabled).

Example

```
switch# auto-confirm
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

configure terminal

```
configure [terminal]
```

Description

Enters the global configuration (**config**) context.

Parameter	Description
`terminal`	Configure from the terminal. This is the default parameter.

Example

```
switch# configure terminal
switch(config)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Exits the manager context (**#**) and enters the operator context (**>**).

Example

```
switch# disable
switch>
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

do

`do <COMMAND>`

Description

Executes a manager context (**#**) or operator context (**>**) command from a configuration (**config**) context.

You can execute **exec** commands from a configuration context with or without using the **do** command.

Parameter	Description
<COMMAND>	Specifies the manager context (**#**) or the operator context (**>**) command to execute.

Usage

You can execute **exec** commands from a configuration context with or without using the **do** command.

Use the **do** command to execute commands such as **clear**, **checkpoint**, **auto-confirm** and **show** commands while you are in a configuration context (such as **config** or **config-vlan-10**).

For all **exec** commands you can use with the **do** command, from the global configuration context (**config**), enter **do**, followed by a space, and then press the tab key twice.

Examples

Clearing LLDP neighbors from the global configuration context:

```
switch(config)# clear lldp neighbors
switch(config)# do clear lldp neighbors
switch(config)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	A configuration context such as `config` or `config-vlan-10`	Administrators or local user group members with execution rights for this command.

enable (manager context)

`enable`

Description

Exits the operator context (**>**) and enters the manager context (**#**).

Example

```
switch> enable
switch#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>)	Administrators or local user group members with execution rights for this command.

end

```
end
```

Description

Exits the current context and enters the manager context (**#**).

Example

```
switch# configure terminal
switch(config)# vlan 10
switch(config-vlan-10)# vlan 22
switch(config-vlan-22)# end
switch#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Any context	Administrators or local user group members with execution rights for this command.

exit

```
exit
```

Description

Exits the current context and enters its parent context.

Example

```
switch# configure terminal
switch(config)# vlan 10
switch(config-vlan-10)# vlan 22
switch(config-vlan-22)# exit
switch(config)# exit
switch#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Any context	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

list

`list`

Description

Shows a list of commands available from the current context.

Example

```
switch> list
  list
  enable
  exit
  show session-timeout
...
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Any context	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

page

```
page [<LINES>]
no page
```

Description

Specifies the number of output lines the CLI displays before pausing to wait for a user to press a key. This value is the number of lines supported by the terminal session. This setting is not persistent and applies to the current session only.

The **page** command is enabled by default on the switch with the number of lines supported by the terminal. Change this default by using the **page** command to specify a different number of output lines.

The **no** form of this command sets the number of lines that are displayed to the default, which is the number of lines supported by the current terminal session.

Parameter	Description
<LINES>	Specifies the number to display before pausing. If not specified, the number of lines supported by the current terminal session is used. Range: 2-1000 lines. Default: The number of lines supported by the current terminal session

Examples

Setting the page size to an unlimited number of lines:

```
switch# no page
switch#
```

Example output of a command after setting the page size to 10 lines:

```
switch# page 10
switch# list
  show hostname
  show domain-name
  list
  configure { terminal }
  disable
  exit
  end
  page
  page <2-1000>
-- MORE --, next page: Space, next line: Enter, quit: q
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

Pipe (|) command

```
show running-config | begin 2 "vlan" | redirect "abc.txt"
show running-config | include "vlan" | exclude "vlan2" | count
show vlan | include "up" | include "VLAN100"

list | include "show" | exclude "show" | count
```

Description

The pipe (|) command filters the output of **show** or **list** commands using the options **include**, **exclude**, **begin**, **count**, or **redirect**.

Usage

```
show {<SHOW-COMMAND-OPTIONS>}... [ | {include <PATTERN-STRING> |
                                      exclude <PATTERN-STRING> |
                                      begin {<LINES-TO-DISPLAY>} <PATTERN-STRING>}]...
                                  [ | {count [<PATTERN-STRING>] |
                                      redirect [<FILE-NAME>]}]

list [ | {include <PATTERN-STRING> |
          exclude <PATTERN-STRING> |
          begin {<LINES-TO-DISPLAY>} <PATTERN-STRING>}]...
     [ | {count [<PATTERN-STRING>] |
          redirect [<FILE-NAME>]}]
```

- The pipe (|) command is supported for use with the **show** and **list** commands only.
- You can use multiple pipe commands with a single **show** or **list** command.

Examples

```
show running-config | redirect "abc.txt"
show running-config | begin 2 "vlan" | begin -2 "vlan" | begin "vlan"
show running-config | include "vlan" | exclude "vlan2" | count
show vlan | include "up" | include "VLAN100"
list | include "show" | exclude "show" | count
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

repeat

```
repeat [id <POSITION>] [<COUNT>] [<DELAY>]
```

Description

Repeatedly executes one or more commands. By default, the most recent command in the history is executed until you press Ctrl+C.

Parameter	Description
<POSITION>	Specifies the position of a command, or range of positions of multiple commands, in the history list as shown in the output of the **show history** command. *<POSITION>* can be a single number, a comma-separated list of numbers, or a range of numbers specified by the beginning and end of the range, separated by a hyphen. If the **id** parameter is not specified, the **repeat** command executes the command that was entered most recently. Default: 1.
<COUNT>	Specifies number of times to execute the command or commands. Default: The command repeats an infinite number of times.
<DELAY>	Specifies the number of seconds to delay before executing the command. Default: 2

Example

```
switch# repeat id 1-4,7-8,10 count 2 delay 3
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

session-timeout

```
session-timeout <MINUTES>
no session-timeout <MINUTES>
```

Description

Specifies the number of minutes a CLI session can be idle before the session is automatically terminated and the user is logged out.

The **no** form of this command sets the timeout to the default value of 30 minutes.

Parameter	Description
<MINUTES>	Specifies the number of minutes the CLI session can remain idle. Specify 0 to configure CLI sessions to never time out. Range: 0 to 4320. Default: 30

Example

```
switch(config)# session-timeout 15
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show session-timeout

```
show session-timeout [vsx-peer]
```

Description

Shows the configured session timeout value.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show session-timeout
session-timeout: 30 minutes (Default)
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show alias

`show alias [vsx-peer]`

Description

Shows the command aliases that are defined on the switch.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show alias
 Alias Name      Alias Definition
 -------------------------------------------------------------------------------
 hst             hostname int_config      interface $1; no shutdown; ip address
$2; lldp receive; mtu $3; exit

switch# show hst
 Alias Name      Alias Definition
 -------------------------------------------------------------------------------
 hst             hostname
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show history

`show history [all-sessions] [timestamp]`

Description

Shows all commands that have been executed by the user in the current session. By default, the output of this command will display up to 500 commands previously executed by the user in the current session.

This command will not display any commands entered by the user that contain sensitive information such as plain text passwords or keys. The output will only be valid for the current boot and not for commands executed in the previous boot.

Parameter	Description
`all-sessions`	Specifies that the output includes commands from the current session as well as previous sessions logged out of by the user. When you include the **all-sessions** parameter, the output of this command will display up to 1000 commands previously executed by the user.
`timestamp`	Specifies that the output include the time of execution of each command in the command history.

If you include the **all-sessions** and **timestamp** parameters in the same command, **timestamp** must always be entered after **all-sessions**. It cannot come before.

Example

Showing a list of commands executed during the current CLI session:

```
switch# show history
5     configure
4     session-timeout 0
3     exit
2     show feature-pack
1     show logging
```

Showing a list of commands executed during the current CLI session, with timestamps:

```
switch# show history timestamp
5     Mon May  6 18:42:05 2024        configure
4     Mon May  6 18:42:08 2024        session-timeout 0
3     Mon May  6 18:42:10 2024        exit
2     Mon May  6 18:42:19 2024        show feature-pack
1     Mon May  6 18:42:29 2024        show logging
```

Showing a list of commands executed by the user both in the current session and during all previous CLI sessions:

```
switch# show history all-sessions
12    configure
11    session-timeout 0
10    exit
9     show feature-pack
8     show logging
7     configure
```

```
6     exit
5     configure
4     alias abcd show running-config
3     abcd
2     show tech
1     exit
```

Showing a list of commands executed by the user both in the current session and during all previous sessions, with timestamps:

```
switch# show history all-sessions timestamp
12    Mon May  6 18:42:05 2024        configure
11    Mon May  6 18:42:08 2024        session-timeout 0
10    Mon May  6 18:42:10 2024        exit
9     Mon May  6 18:42:19 2024        show feature-pack
8     Mon May  6 18:42:29 2024        show logging
7     Mon May  6 18:42:44 2024        configure
6     Mon May  6 18:42:55 2024        exit
5     Mon May  6 18:45:41 2024        configure
4     Mon May  6 18:45:55 2024        alias abcd show running-config
3     Mon May  6 18:45:59 2024        abcd
2     Mon May  6 18:46:09 2024        show tech
1     Mon May  6 18:46:14 2024        exit
```

Attempting to specify the timestamp parameter before the all-sessions parameter:

```
switch# show history timestamp all-sessions
Invalid input: all-sessions
```

Command History

Release	Modification
10.14	The **all-sessions** parameter is introduced.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

Chapter 21

CLI user session management commands

cli-session

```
cli-session
no cli-session
```

Description

Enters the CLI session context (shown in the switch prompt as **config-cli-session**) for the purpose of configuring CLI user session management. Session management enhances security by enforcing specific CLI user session requirements. The following information is provided at time of successful login:

- When applicable, the number of failed login attempts since the most recent successful login.
- The date, time, and location (console or IP address or hostname) of the most recent previous successful login.
- The count of successful logins within the past (configurable) time period.

For example:

```
switch login: admin
Password:

There were 3 failed login attempts since the last successful login
Last login: 2019-04-20 08:51:33 from the console
User "admin" has logged in 73 times in the past 30 days
```

The no form of this command disables concurrent CLI user session restrictions and reverts **timeout** and **tracking-range** to their default values.

To ensure that enhanced security is maintained, it is recommended that you keep CLI user session management fully enabled by setting **max-per-user** to a nondefault value.

The **cli-session** command applies only to SSH/console login connection types. It does not apply to other connection types such as REST.

Subcommands

These subcommands are available within the CLI session context.

```
[no] max-per-user  <SESSIONS>
```

Specifies the maximum number of concurrent CLI sessions per user. The no form of this subcommand disables concurrent CLI user session restrictions. Default: Disabled (no value). Range: 1 to 5.

When the same user name is configured for both local and remote authentication, both users, regardless of privilege level, are considered to be the same user for the purpose of counting concurrent CLI sessions. For example, with **max-per-user** set to 1 and user **admin1** configured for local and remote authentication, only the local user **admin1** or the remote user **admin1** can be logged in at any given moment. Both **admin1** users cannot be logged in simultaneously unless **max-per-user** is increased to at least 2.

`[no] timeout <MINUTES>`

Specifies the number of minutes a CLI session can be idle before the session is automatically terminated and the user is logged out. A value of 0 minutes disables the session timeout. The no form of this subcommand sets the timeout value to the default. Default 30: Range 0 to 4320.

This subcommand is the recommended replacement for the **session-timeout** command.

`[no] tracking-range <DAYS>`

Specifies the maximum number of days to track CLI user session logins. The no form of this subcommand resets the value to its default. Default 30: Range 1 to 30.

`exit`

Exits the CLI session context.

`end`

Exits the CLI session context and then the config context.

Examples

Configuring CLI user session settings for a maximum of one concurrent session, a 20-minute timeout, and tracking for a maximum of 25 days.

```
switch(config)# cli-session
switch(config-cli-session)# max-per-user 1
switch(config-cli-session)# timeout 20
switch(config-cli-session)# tracking-range 25
switch# exit
```

After successful earlier logins, logging in from the console without any intervening unsuccessful logins.

```
switch login: admin1
Password:

Last login: 2019-04-15 14:10:21 from the console
User 'admin1' has logged in 65 times in the past 25 days
```

Attempting to log in as `admin1` when already logged in as **admin1** from elsewhere.

```
switch login: admin1
Password:
Too many logins for 'admin1'
```

After successful earlier logins, attempting to log in twice with an invalid password, followed by a successful login.

```
switch login: admin1
Password:
```

```
Login incorrect
switch login: admin1
Password:

Login incorrect
switch login: admin1
Password:

There were 2 failed login attempts since the last successful login
Last login: 2019-04-15 17:22:45 from 192.168.1.1
User 'admin1' has logged in 72 times in the past 25 days
```

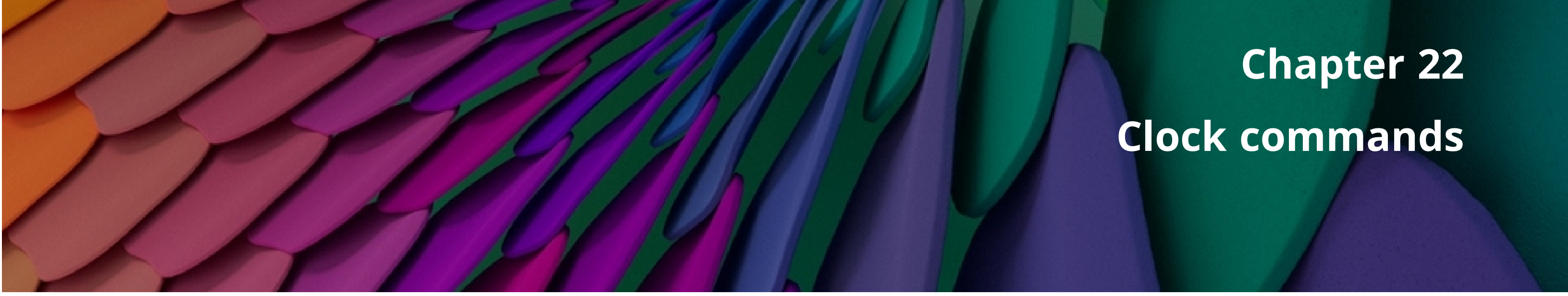
For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.



Chapter 22
Clock commands

clock date

`clock date <DATE>`

Description

Sets the switch date.

Parameter	Description
<DATE>	Specifies the date. Format: **YYYY-MM-DD**.

Examples

This example sets the date to Dec 14, 2017.

```
switch(config)# clock date 2017-12-14
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

clock datetime

`clock datetime <DATE> <TIME>`

Description

Sets the switch date and time.

Parameter	Description
<DATE>	Specifies the date. Format: **YYYY-MM-DD**.

Parameter	Description
<TIME>	Specifies the time in 24-hour clock format. Seconds are optional. Format: **HH:MM** or **HH:MM:SS**.

Examples

This example sets the date and time to Dec 13, 2017 at 15:00.

```
switch(config)# clock datetime 2017-12-13 14:15:00
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

clock time

`clock time <TIME>`

Description

Sets the switch time.

Parameter	Description
<TIME>	Specifies the time in 24-hour clock format. Seconds are optional. Format: **HH:MM** or **HH:MM:SS**.

Examples

This example sets the time to 15:01:23.

```
switch(config)# clock time 15:01:23
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

clock timezone

```
clock timezone <TIME-ZONE>
no clock timezone [<TIME-ZONE>]
```

Description

Sets the time zone and its associated daylight savings time rule.

The **no** form of this command sets the time zone to the default value of UTC.

Parameter	Description
<TIME-ZONE>	Specifies the time zone, **<TIME-ZONE>**, using a name defined in the IANA time zone database. See https://en.wikipedia.org/wiki/List_of_tz_database_time_zones.

Examples

Setting the time zone to Eastern Standard Time (EST):

```
switch(config)# clock timezone EST
```

Command History

Release	Modification
10.08	Added optional **<TIME-ZONE>** parameter to **no** form of the command.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show clock

```
show clock
```

Description

This command displays the current date, time, and time zone.

Example

```
switch# show clock
Wed Nov 22 23:29:10 PDT 2017
System is configured for timezone : US/Pacific
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 23

Container management commands

container

```
container <CONTAINER-NAME>
no container <CONTAINER-NAME>
```

Description

Enters into the container configuration context.

The **no** form of this command removes the existing configurations of the specified container.

Example

Configures a new container:

```
switch(config)# container app
The feature being used requires a AOS-CX Advanced Software Feature Pack.
For more information,refer to the AOS-CX Feature Pack Deployment Guide.
```

AOS-CX does not enforce the requirement to own a feature pack prior to using container features. This warning message is displayed only during creation, subsequent calls to the container context will not display the message.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority

6300, except for S3L75A, S3L76A and S3L77A
6400
	`config`
	`config-container-<CONTAINER-NAME>`
		Administrators or local user group members with execution rights for this command.

container exec

```
container <NAME> exec <PARAMS>
```

Description

Allows the execution of an endpoint script in the container. The location of this endpoint is provided to the container manager infrastructure through a manifest file in the image file system of the container.

This manifest file provides metadata related to the container application. When the exec command runs, the manifest information is used to determine the endpoint to execute and the user parameters are passed directly to the endpoint. The output of such execution is provided directly to the user through the CLI. In case the manifest information or the endpoint file are missing an error is presented to the user. User can interrupt the execution by using Ctrl+C.

If the container is not operational when the command is executed, the following error message is returned:
Failed to execute endpoint - The container is not operational.

Parameter	Description
<NAME>	Specifies a container name up to 64 characters long.
`exec`	Runs a container application command.
<PARAMS>	Specifies container command parameters.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	`config-container-<CONTAINER-NAME>`	Administrators or local user group members with execution rights for this command.

env

```
env <NAME> {value <VALUE>}|{encrypted [plaintext <VALUE>|ciphertext <VALUE>]}
no env <NAME> {value <VALUE>}|{encrypted {plaintext|ciphertext}<VALUE>}
```

Description

Configures an environment variable for a container that is composed of a key and a value pair. The key-value pair defines the behavior of the environment in a container and is used by the container processes. The value of the environment variable can be stored in the host system as an encrypted value. The container manager infrastructure provides the decrypted value to the container.

The **no** form of this command removes the configured environment variable from a container.

Configuring the **env** variable for an already operational container causes the container to restart.

Parameter	Description
`<NAME>`	Specifies the name of the container environment variables.
`value <VALUE>`	Specifies the variable value.
`encrypted`	Encrypts the environment variable value. If you press **<enter>** after the **encrypted** parameter, you will enter a variable configuration mode that allows you to securely enter a hidden value. *This is the recommended method for entering an encrypted variable*
`plaintext <VALUE>`	**Optional**. Specifies the variable value in plain text. *Not recommended for encrypted variables.*
`ciphertext <VALUE>`	**Optional**. Specifies the variable value as previously encrypted text. *Recommended for encrypted variables; specify the encrypted variable value as previously encrypted text.*

Example

Securely entering an encrypted variable:

```
6300(config-container-test)# env TEST encrypted
Enter environment variable value: ********
6300(config-container-test)# end
```

Command History

Release	Modification
10.13.1000	The **plaintext** and **ciphertext** options for the encrypted parameter are now optional. Starting with this release, you can use the **encrypted** option to encrypt the environment variable and specify the value in plaintext hidden from the CLI.
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	`config-container-<CONTAINER-NAME>`	Administrators or local user group members with execution rights for this command.

image-location

```
image-location <URL> [vrf <VRF-NAME>][allow-unsigned]
no image-location <URL> [<VRF-NAME>][allow-unsigned]
```

Description

Configures the image location for a container. Modifying image location prompts an image upgrade.

The **no** form of this command removes the configured location of a container.

- If the user sets a location value which does not follow the standard URL format, the following error message is returned: **Failure to configure image location: Invalid URL**
- If the user tries to use a VRF value that doesn't exist on the switch, the following error message is returned: **Failure to configure image location: Invalid VRF**
- If the image of the container exceeds 500mb the container won´t be deployed

By default, only container images with a valid HPE signature are allowed. To bypass this signature check and allow unsigned container images, include the **allow-unsigned** parameter when you define the image location. The **allow-unsigned** parameter cannot be used if you have issued the **secure-mode enhanced** command to set the switch to enhanced secure mode.

Parameter	Description
`URL`	Specifies the URL of the container application. URL supports HTTP protocol. The image-location URL can either be IPv4 or IPv6 address. The IPv6 address must be provided within square brackets.
`vrf` *`<VRF-NAME>`*	(Optional) Specifies the VRF of the image URL.
`allow-unsigned`	(Optional) Allow download and deployment of an unsigned container image.

Examples

Configures the image location for the IPv4 setting:

```
switch(config)# image-location http://10.0.0.1/container.img vrf mgmt
```

Appends the port to the address if the image server is running on a port other than HTTP for an IPv4 setting:

```
switch(config)# image-location http://10.0.0.1:9050/container.img vrf mgmt
```

Configures image location for IPv6 setting by wrapping IP address between square brackets:

```
switch(config)# image-location http://[2001::2]/container.img vrf mgmt
```

Specifies port number by appending it with the IPv6 address:

```
switch(config)# image-location http://[2001::2]:9050/container.img vrf mgmt
```

When you include the **allow-unsigned** parameter on a switch in standard secure mode, the following message will be displayed to inform this can be a potential security issue.

```
switch(config)# image-location http://10.0.0.1/container.img vrf mgmt allow-
unsigned
Allowing unsigned container images poses a potential security risk
that can impact both the current device and the entire network. By
allowing installation of unsigned applications you are acknowledging
and accepting these risks. HPE shall not be responsible for the
consequences of your actions and disclaims any and all liability.

Continue (y/n)? y
```

When you attempt to include the **allow-unsigned** parameter on a switch in enhanced secure mode, the following message will appear to indicate that this parameter is not supported.

```
switch(config)# image-location http://10.0.0.1/container.img vrf mgmt allow-
unsigned
Unsigned images are not permitted in the current secure mode, using the
allow-unsigned parameter will have no effect.
```

Release	Modification
10.14	The **allow-unsigned** parameter is introduced.
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	`config-container-<CONTAINER-NAME>`	Administrators or local user group members with execution rights for this command.

restrict cpu

```
restrict cpu <PERCENTAGE>
no restrict cpu
```

Description

Configures limitations for the container CPU usage. The CPU constraint is set as a percentage of the total switch CPUs. A container can use up to 20% of the total CPU capacity of the device.

Configuring the CPU constraint for an already operational container will cause the container to restart.

The **no** form of this command removes restrictions on the CPU usage.

Parameter	Description
<PERCENTAGE>	Specifies percentage for the container CPU usage, The default value is 10%.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	`config-container-<CONTAINER-NAME>`	Administrators or local user group members with execution rights for this command.

restrict memory

```
restrict memory <MB>
no restrict memory
```

Description

Configures limitations for memory usage of the container. The memory constraint is set in MB, and the maximum 20% of the capacity of the device can be configured. Configuring the memory constraint for an already operational container restarts the container.

The **no** form of this command removes restrictions on the memory usage.

Parameter	Description
<MB>	Specifies the maximum memory usage in MB.The default value is 256 MB.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	`config-container-<CONTAINER-NAME>`	Administrators or local user group members with execution rights for this command.

show container

```
show container [<CONTAINER-NAME>]
```

Description

Shows the configuration and status information of the containers running in the system. If the container name is not specified, displays information of all the containers. When a container name is specified, displays information specific to the container.

Parameter	Description
<CONTAINER-NAME>	Specifies the name of the container for which information need to be specified.

Examples

The following example shows configured container information:

```
  switch# show container
  Container              : app
    Container status     : operational
    Manifest status      : success
    Image status         : verified
    Image version        : 1.0.0
    Image location VRF   : mgmt
    Image location URL   : http://30.0.0.2:8000/container.img
    CPU limit            : 10%
    Memory limit         : 512 MB
    VRFs                 : mgmt
    Environment variables:
      PYP=/usr/bin/python3
    Encrypted environment variables:
      encryptedVar1
      encryptedVar2
```

The following example shows additional error messages:

```
switch# show container
Container                : app
  Container status       : configuration failed
  Config failure reason  : Multiple definitions of environment variable PYP
  Manifest status        : error
  Manifest status reason : 'exec' file not found in container
  Image status           : verified
  Image version          : 1.0.0
  Image location VRF     : mgmt
  Image location URL     : http://30.0.0.2:8000/container.img
  CPU limit              : 10%
  Memory limit           : 512 MB
  VRFs                   : mgmt
  Environment variables  :
    PYP=/usr/bin/python3
  Encrypted environment variables:
    PYP
    encryptedVar2
```

The following example shows a configured container without signature validation:

```
switch# show container app1
```

```
Container              : app1
  Container status     : operational
  Manifest status      : success
  Image status         : allowed without signature
  Image version        : 1.0.0
  Image location VRF   : mgmt
  Image location URL   : http://30.0.0.2:8000/container.img
  CPU limit            : 10%
  Memory limit         : 512 MB
  Environment variables:
    PYP=/usr/bin/python3
  Encrypted environment variables:
    encryptedVar1
    encryptedVar2
  Network:
    VRF name  : mgmt
    Preferred : no
    Port map  : n/a

    VRF name  : default
    Preferred : yes
    Port map  :
      8080:80/tcp
      8080:8080/udp
```

The following example shows the command out when there are no configured containers:

```
switch# show container
No containers configured
```

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities containers

```
show capacities containers
```

Description

Shows the maximum number of containerized applications that can be configured in the system.

Examples

Shows maximum number of containerized applications that can be configured:

```
switch# show capacities containers
System Capacities: Filter CONTAINERS
Capacities Name                                                           Value
----------------------------------------------------------------------------------
----
Maximum number of containerized applications configurable in the system   2
                                 2
```

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities-status containers

```
show capacities-status containers
```

Description

Reserved for future use.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config container

```
show running-config container
```

Description

Shows the running configuration of all the containers.

Parameter	Description
`container`	Specifies that container running configuration must be displayed.

Examples

Shows the running configuration for the container:

```
container app1
    image-location http://30.0.0.2:8000/container.img vrf mgmt
    restrict cpu 10
    restrict memory 512
    vrf attach mgmt
    env PYP value /usr/bin/python3
    env encryptedVar1 encrypted ciphertext
AQBapcmUTCVdagTGkLA3m6NsslLgNOdxqUP0j+CCaCxVdz7oEwAAAOmmBmgPHGavS+6GkgmtwE4NU1Y=

container app2
    image-location http://[2001::2]:8000/changeValidation_x86_t.img vrf mgmt
    restrict cpu 5
    restrict memory 256
    vrf attach mgmt
    env PYP value /usr/bin/python3
    env encryptedVar1 encrypted ciphertext
AQBapcmUTCVdagTGkLA3m6NsslLgNOdxqUP0j+CCaCxVdz7oEwAAAOmmBmgPHGavS+6GkgmtwE4NU1Y=
    env encryptedVar2 encrypted ciphertext
AQBapY4V4v9UtDaazZaaJMeROhUizlVYVrTKKpa1N1bABTYICQAAACiXj/d3ZtBSYg==
```

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

vrf

`vrf <VRF-NAME>`

Description

Allows container L3 connectivity using the given VRF. The container network namespace is connected to the VRF using the source NAT.

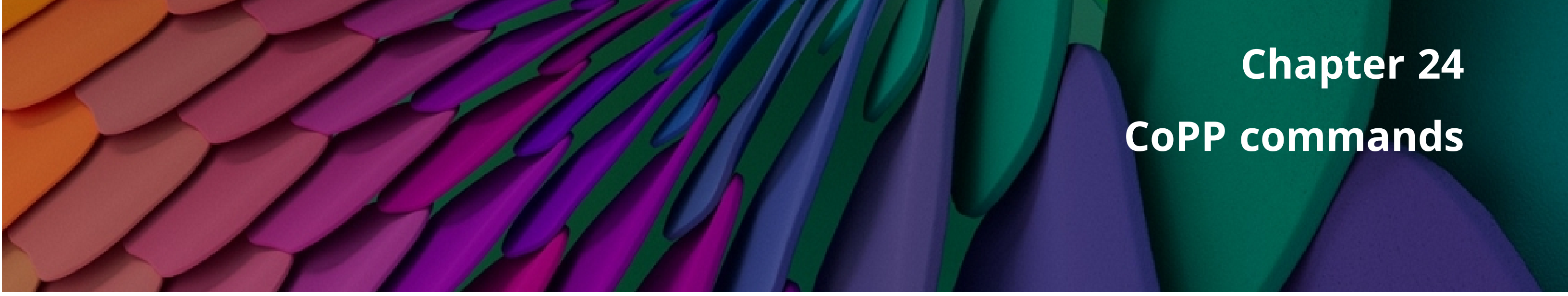
Parameter	Description
<VRF-NAME>	Specifies the *VRF-NAME* used by the container application.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300, except for S3L75A, S3L76A and S3L77A 6400	`config-container-<CONTAINER-NAME>`	Administrators or local user group members with execution rights for this command.



Chapter 24

CoPP commands

Classes of traffic

The different classes of traffic that can be individually configured are:

- `acl-logging`: Access Control List logging packets.
- `arp-broadcast`: Address Resolution Protocol packets with a broadcast destination MAC address.
- `arp-protect`: Address Resolution Protocol packets intercepted and inspected for ARP protection.
- `arp-unicast`: Address Resolution Protocol packets with a switch system destination MAC address.
- `bfd-control`: Bidirectional Forwarding Detection (BFD) control packets with a destination IP address owned by the switch.

> The `bfd-control` class is not supported for 6200 switch.

- `bgp`: Border Gateway Protocol packets with a destination IPv4 or IPv6 address owned by the switch.

> The `bgp` class is not supported for 6200 switch.

- `captive-portal`: Packets intercepted in support of the Captive Portal feature.
- `dhcp`: Dynamic Host Configuration Protocol packets. Also includes snooped DHCP packets if DHCP snooping is enabled.
- `erps`: Ethernet Ring Protection Switching control packets with the destination MAC address 01:19:a7:00:00:XX, where XX can be any value.
- `icmp-broadcast-ipv4`: Internet Control Message Protocol packets with a broadcast or multicast destination IPv4 address.
- `icmp-multicast-ipv6`: Internet Control Message Protocol packets with a well-known multicast destination IPv6 address.
- `icmp-security-ipv6`: IPv6 Internet Control Message Protocol packets intercepted and inspected.
- `icmp-unicast-ipv4`: Internet Control Message Protocol packets with a destination IPv4 address owned by the switch
- `icmp-unicast-ipv6`: Internet Control Message Protocol packets with a destination IPv6 address owned by the switch.
- `ieee-8021x`: IEEE 802.1X protocol packets with EtherType 0x0888E.
- `igmp`: Internet Group Management Protocol packets.
- `ip-exceptions`: Routable packets that would exceed the MTU for the egress interface, packets that trigger ICMP redirects, and packets with TTL/hop_limit=1 that are discarded when routing through the switch.
- `ip-lockdown`: Packets denied and logged due to violation of allowed "IP address/VLAN/port/MAC address" association.

- `ip-tracker`: Track packets received for client IP address tracking.

  > The `ip-tracker` class is not supported for 6300 and 6400 switches.

- `ipsec`: Internet Protocol Security IPv4 or IPv6, unicast or configured multicast. All IPsec traffic received by the CPU will be regulated by the `ipsec` class regardless of the encapsulated protocol.
- `ipv4-options`: Unicast IPv4 packets including option headers.
- `lacp`: Link Aggregation Control Protocol packets with the destination MAC address 01:80:c2:00:00:02.
- `lldp`: Link Layer Discovery Protocol packets with the destination MAC address 01:80:c2:00:00:0e.
- `loop-protect`: Loop Protection packets with the destination MAC address 09:00:09:09:13:a6.
- `mac-lockout`: Packets denied and logged due to locked-out MAC address.
- `manageability`: Unicast IP packets addressed to the switch for specific protocols that do not have a dedicated CoPP class like HTTP, SSH, Telnet, and RADIUS.
- `mirror-to-cpu`: Packets from mirroring session configured to deliver to the console.
- `mld`: Multicast Listener Discovery packets of type V1 or V2 with an IPv6 address of FF00::/8, FF02::16 or FF02::2.
- `mvrp`: Multiple VLAN Registration Protocol packets with the destination MAC address 01:80:c2:00:00:20 or 01:80:c2:00:00:21
- `ntp`: Network Time Protocol packets with a destination IP address owned by the switch.
- `ospf-multicast`: Open Shortest Path First packets with the multicast destination IPv4 address 224.0.0.5 or 224.0.0.6, or IPv6 address FF02::5 or FF02::6.
- `ospf-unicast`: Open Shortest Path First packets with a local destination IPv4 address or IPv6 address.
- `pim`: Protocol Independent Multicast packets with the destination IPv4 address 224.0.0.13 or IPv6 address FF02::D, or with a destination IP address owned by the switch.
- `secure-learn`: Packets intercepted and inspected to see if source MAC address is allowed on the port.
- `sflow`: Packet headers sampled by the switch that will be sent to the sFlow collector.
- `stp`: Spanning Tree Protocol (STP) packets with the destination MAC address 01:80:c2:00:00:00 or Per-VLAN Spanning Tree (PVST) packets with the destination MAC address 01:00:0c:cc:cc:cd.
- `udld`: Unidirectional Link Detection packets with the destination MAC address 01:00:0c:cc:cc:cc or 00:e0:52:00:00:00, or Cisco Discovery Protocol packets with the destination MAC address 01:00:0c:cc:cc:cc.
- `unknown-multicast`: Packets with an unknown multicast destination IP address.
- `unresolved-ip-unicast`: Packets to be software forwarded by the management processor.
- `vrrp`: Virtual Router Redundancy Protocol packets with the destination IPv4 address 224.0.0.18 or IPv6 address FF02::12, or VSX-Keepalive packets.

To regulate any other traffic destined for the CPU, every CoPP policy has a class named `default` that can also be configured to regulate other traffic to the CPU or prevent other traffic from being delivered.

> All IPsec traffic received by the CPU will be regulated by the `ipsec` class regardless of the encapsulated protocol.
>
> When ARP protection is enabled on the system, all ARP traffic will be regulated by the `arp-protect` class, regardless of the ARP destination and configuration of `arp-broadcast` or `arp-unicast` CoPP classes.
>
> Packets for each of the CoPP classes above may have arrived through a tunnel, if tunneling was enabled.

apply copp-policy

```
apply copp-policy { <NAME> | default }
no apply copp-policy <NAME>
```

Description

Applies a CoPP policy to the switch, replacing the policy that is in effect. There may be a brief interruption in traffic flow to the management processor while the switch implements the change.

Enter the **no apply copp-policy <NAME>** command with the name of a CoPP policy to unapply a CoPP policy and apply the default CoPP policy. This will only take effect if the specified policy is actively applied. Since there must always be a CoPP policy applied, this command effectively attempts to replace the applied CoPP policy with the default CoPP policy. The default CoPP policy cannot be unapplied using this command.

Parameter	Description
<NAME>	Specifies the name of the policy to apply. Length: 1 to 64 characters.
default	Applies the default policy.

Usage

If the new policy cannot be applied (for example, due to a lack of hardware resources), the previous policy remains in effect. Use the show copp-policy command to determine which policy is in effect.

Examples

Applying a policy named My_CoppPolicy:

```
switch(config)# apply copp-policy My_CoppPolicy
```

Applying the default policy:

```
switch(config)# apply copp-policy default
```

Unapplying a policy named My_CoppPolicy:

```
switch(config)# no apply copp-policy My_CoppPolicy
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

class

```
class <CLASS> {drop | priority <PRIORITY> rate <RATE> [burst <BURST>]}
no class <CLASS> {drop | priority <PRIORITY> rate <RATE> [burst <BURST>]}
```

Description

Adds a class to a CoPP policy. If the class exists, the existing class is modified. Changes made to an active (applied) policy take effect immediately.

When adding or modifying a class in an active policy, CoPP immediately activates the change on the switch. In cases where insufficient hardware resources exist to support a class or its action, CoPP fails to activate the changed class on the switch. When this failure occurs, the active configuration on the switch will be out of sync with its definition. To diagnose and remedy this situation:

- Use the show copp-policy command to determine which classes are out of sync between the active policy and its definition.
- Use the reset copp-policy command to synchronize the active policy with its definition. This synchronization changes the classes in the definition to match the classes in the active policy.

The **no** form of this command removes the configuration for the class. Traffic for the class will be prioritized and regulated using the factory default configuration for the class. Use the **show copp-policy factory-default** command to display the factory default CoPP policy. To stop a class of traffic from reaching the processor, set the class action to drop.

Parameter	Description
`<CLASS>`	Specifies the class to add or edit.
`drop`	Drop packets matching the selected class.
`priority <PRIORITY>`	Specifies the priority for packets matching the selected class. Range: 0 to 6.
`rate <RATE>`	Specifies the maximum rate, in packets per second (pps), for packets matching the selected class. Range: 25 to 99999.
`burst <BURST>`	Specifies the maximum burst size, in packets, for packets matching the selected class. Range: 1 to 9999.

Examples

Adding a class to handle LACP traffic with priority of 2 and rate of 2000:

```
switch(config-copp)# class lacp priority 2 rate 2000
```

Modifying the class to drop LLDP packets:

```
switch(config-copp)# class lldp drop
```

Removing the class that handles LLDP packets.

```
switch(config-copp)# no class lldp
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-copp	Administrators or local user group members with execution rights for this command.

clear copp-policy statistics

```
clear copp-policy statistics
```

Description

Resets statistics for all CoPP classes to zero.

Examples

Displaying and then resetting statistics for all classes in the active policy:

```
switch# show copp-policy statistics
Statistics for CoPP policy 'default':
Totals:
    packets passed   : 1000               packets dropped  : 1500
Class: default
    packets passed   : 400                packets dropped  : 600
Class: acl-logging
    packets passed   : 100                packets dropped  : 100
Class: arp-broadcast
    packets passed   : 500                packets dropped  : 800
        <--OUTPUT OMITTED FOR BREVITY-->
switch# clear copp-policy statistics
switch# show copp-policy statistics
Statistics for CoPP policy 'default':
Totals:
    packets passed   : 0                  packets dropped  : 0
Class: default
    packets passed   : 0                  packets dropped  : 0
Class: acl-logging
```

```
    packets passed   : 0                   packets dropped  : 0
Class: arp-broadcast
    packets passed   : 0                   packets dropped  : 0
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

copp-policy

```
copp-policy {<NAME> | default [revert]}
no copp-policy <NAME>
```

Description

Creates a CoPP policy and switches to the **config-copp** context for the policy. Or, if the specified policy exists, switches to the **config-copp** context for the policy. A predefined policy, named **default**, contains factory default classes and is applied to the switch at first startup. This policy cannot be deleted, but its configuration can be changed.

The **no** form of this command removes a CoPP policy. If a policy is active (applied), it cannot be removed . It must be replaced with another policy before it can be removed.

Parameter	Description
<NAME>	Specifies the name of the policy to add or edit. Length: 1 to 64 characters. The name must not be a substring of any of the following reserved words: default, factory-default, commands, configuration, or statistics.
default	Specifies the default CoPP policy. Use this default policy to configure the default policy.
revert	Sets the default CoPP policy to its factory settings.

Examples

Creating a policy named My_CoppPolicy:

```
switch(config)# copp-policy My_CoppPolicy
switch(config-copp)#
```

Removing a policy named My_CoppPolicy:

```
switch(config)# no copp-policy My_CoppPolicy
```

Setting the default policy to its factory settings:

```
switch(config)# copp-policy default revert
```

Unapplying the policy named My_CoppPolicy:

```
switch(config)# no apply copp-policy My_CoppPolicy
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

default-class

`default-class priority <PRIORITY> rate <RATE> [burst <BURST>]`

Description

Configures the default class that is automatically defined for all CoPP policies. The default class cannot be removed, but its configuration can be changed. The default class is applied to traffic that does not match any other class defined for a policy.

Parameter	Description
`priority <PRIORITY>`	Specifies the priority for packets matching the selected class. Range: 0 to 6.
`rate <RATE>`	Specifies the maximum rate, in packets per second (pps), for packets matching the selected class. Range: 25 to 99999.

Parameter	Description
burst *<BURST>*	Specifies the maximum burst size, in packets, for packets matching the selected class. Range: 1 to 9999.

Example

Setting the default class to a priority of **2** and rate of **2000**:

```
switch(config-copp)# default-class priority 2 rate 2000
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-copp	Administrators or local user group members with execution rights for this command.

reset copp-policy

reset copp-policy { *<NAME>* | default }

Description

Resets an active CoPP policy to match the settings that are currently in effect for the active policy on the switch. Changes made to the active policy that could not be activated are removed from the active policy. When the switch fails to add or modify a class in an active CoPP policy, it is possible the active policy settings on the switch may be out of sync with those defined in the policy.

Parameter	Description
<NAME>	Specifies the name of the policy to reset. Length: 1 to 64 characters.
default	Resets the default policy to match its active settings.

Examples

Resetting a policy named My_CoppPolicy:

```
switch# show copp-policy My_CoppPolicy
class                  drop priority rate pps burst pkts hardware rate pps
```

```
--------------------- ---- -------- -------- ---------- -----------------
igmp                       6        5000     60         5000
lacp                       2        2000     2050       2000
default                    1        6000     70         6000
switch# config terminal
switch(config)# copp-policy My_CoppPolicy
switch(config-copp)# class stp priority 4 rate 4000 burst 60
switch(config-copp)# do show copp-policy My_CoppPolicy
class                 drop priority rate pps burst pkts hardware rate pps
--------------------- ---- -------- -------- ---------- -----------------
igmp                       6        5000     60         5000
lacp                       2        2000     2050       2000
default                    1        6000     70         6000
% Warning: user-specified classes in CoPP policy My_CoppPolicy do not match
 active configuration.
switch(config-copp)# do show copp-policy My_CoppPolicy configuration
class                 drop priority rate pps burst pkts applied
--------------------- ---- -------- -------- ---------- -------
igmp                       6        5000     60         yes
lacp                       2        2000     2050       yes
stp                        4        4000     60         no
default                    1        6000     70         yes
% Warning: user-specified classes in CoPP policy My_CoppPolicy do not match
 active configuration.
switch(config-copp)# exit
switch(config)# reset copp-policy My_CoppPolicy
switch(config)# do show copp-policy My_CoppPolicy
class                 drop priority rate pps burst pkts hardware rate pps
--------------------- ---- -------- -------- ---------- -----------------
igmp                       6        5000     60         5000
lacp                       2        2000     2050       2000
default                    1        6000     70         6000
```

Resetting the default policy:

```
switch(config)# reset copp-policy default
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

show copp-policy

```
show copp-policy  [<NAME> | default] [commands] [configuration] [vsx-peer]
```

Description

Shows CoPP policy settings for a specific CoPP policy. When entered without specifying either a name or the `default` parameter, shows all the CoPP policy settings that are active on the switch and have successfully been programmed into the hardware.

A warning is displayed if:

- The active and user-specified applications of a policy do not match.
- The active and user-specified configurations of a policy do not match.

Parameter	Description
<NAME>	Specifies the name of the policy for which to display settings. Length: 1 to 64 characters.
`default`	Displays CoPP settings for the default policy.
`commands`	Displays output as CLI commands.
`configuration`	Displays user-specified CoPP settings and **not** the active settings.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Displaying the CoPP policies defined in the configuration and the active application:

```
switch#
show copp-policy
applied copp_policy_name
------- ----------------
        My_CoppPolicy
applied default
switch#
```

Displaying the active configuration of all CoPP policies as CLI commands:

```
switch# show copp-policy commands
copp-policy My_CoppPolicy
    class igmp priority 6 rate 5000 burst 60
    class lacp priority 2 rate 2000 burst 2050
    default-class priority 1 rate 6000 burst 70
copp-policy default
    class acl-logging priority 0 rate 25 burst 3
    class arp-broadcast priority 2 rate 1250 burst 1250
    class arp-protect priority 2 rate 2075 burst 2075
    class arp-unicast priority 3 rate 825 burst 825
    class bfd-control priority 5 rate 850 burst 850
        <--OUTPUT OMITTED FOR BREVITY-->
    default-class priority 2 rate 4225 burst 528
apply copp-policy default
switch#
```

Displaying the `default` policy:

```
switch# show copp-policy default
class                 drop priority rate pps burst pkts hardware rate pps
--------------------- ---- -------- -------- ---------- -----------------
acl-logging                0        25       3          25
arp-broadcast              2        1250     1250       1250
arp-protect                2        2075     2075       2075
arp-unicast                3        825      825        825
bfd-control                5        850      850        850
    <--OUTPUT OMITTED FOR BREVITY-->
default                    2        4225     528        4225
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show copp-policy factory-default

```
show copp-policy factory-default [commands] [vsx-peer]
```

Description

Display the configuration for the factory-default CoPP policy.

Parameter	Description
`commands`	Displays output as CLI commands.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Displaying the factory-default policy:

```
switch# show copp-policy factory-default
class                 drop priority rate pps burst pkts
--------------------- ---- -------- -------- ----------
acl-logging                0        25       3
```

```
arp-broadcast              2        1250     1250
arp-protect                2        2075     2075
arp-unicast                3        825      825
bfd-control                5        850      850
    <--OUTPUT OMITTED FOR BREVITY-->
default                    2        4225     528
```

Displaying the active configuration of **My_CoppPolicy** (**My_CoppPolicy** is applied):

```
switch# config terminal
switch(config)# apply copp-policy My_CoppPolicy
switch(config)# do show copp-policy My_CoppPolicy
class                 drop priority rate pps burst pkts hardware rate pps
--------------------- ---- --------- -------- ---------- -----------------
igmp                       6        5000     60         5000
lacp                       2        2000     2050       2000
default                    1        6000     70         6000
```

Displaying the active configuration of **My_CoppPolicy** as CLI commands:

```
switch# show copp-policy My_CoppPolicy commands
copp-policy My_CoppPolicy
    class igmp priority 6 rate 5000 burst 60
    class lacp priority 2 rate 2000 burst 2050
    default-class priority 1 rate 6000 burst 70
apply copp-policy My_CoppPolicy
```

Displaying the user-specified configuration of **My_CoppPolicy**:

```
switch# show copp-policy My_CoppPolicy configuration
class                 drop priority rate pps burst pkts applied
--------------------- ---- --------- -------- ---------- -------
igmp                       6        5000     60         yes
lacp                       2        2000     2050       yes
default                    1        6000     70         yes
```

Displaying the user-specified configuration of **My_CoppPolicy** as CLI commands:

```
switch# show copp-policy My_CoppPolicy commands configuration
copp-policy My_CoppPolicy
    class igmp priority 6 rate 5000 burst 60
    class lacp priority 2 rate 2000 burst 2050
    default-class priority 1 rate 6000 burst 70
apply copp-policy My_CoppPolicy
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show copp-policy statistics

```
show copp-policy statistics [class <CLASS> | default-class | non-zero] [vsx-peer]
```

Description

Displays statistics for all classes, a single class, or all classes with non-zero statistics in the active CoPP policy.

Parameter	Description
<CLASS>	Specifies the class for which to display statistics.
default-class	Displays statistics for the default class.
non-zero	Displays statistics for all classes with non-zero statistics.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

If a single class is specified, the priority, rate, and burst size that has been programmed in hardware for that class will be shown.

Examples

Applying the **default** CoPP policy and displaying statistics for all classes in the actively applied policy:

The rate displayed is the actual rate in hardware.

```
switch# config terminal
switch(config)# apply copp-policy default
switch(config)# exit
switch# show copp-policy statistics
Statistics for CoPP policy 'default':
Totals:
    packets passed   : 1000               packets dropped   : 1500
Class: default
    packets passed   : 400                packets dropped   : 600
Class: acl-logging
    packets passed   : 100                packets dropped   : 100
Class: arp-broadcast
    packets passed   : 500                packets dropped   : 800
        <--OUTPUT OMITTED FOR BREVITY-->
```

Displaying statistics for the default class in the active policy:

```
switch(config)# show copp-policy statistics default-class
Statistics for CoPP policy 'default':
Class: default
Description: Default
    priority             : 2
    rate (pps)           : 4225
    burst size (pkts)    : 528


    packets passed   : 400                packets dropped  : 600
```

Displaying statistics for the class **arp-broadcast** in the actively applied policy:

```
switch# show copp-policy statistics class arp-broadcast
Statistics for CoPP policy 'default':
Class: arp-broadcast
Description: Address Resolution Protocol broadcast
    priority             : 2
    rate (pps)           : 1250
    burst size (pkts)    : 1250

    packets passed   : 500                packets dropped  : 800
```

For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show tech copp

```
show tech copp
```

Description

Displays the output of all show commands supported by CoPP.

Examples

Capturing the command output into a local file:

```
switch# show tech copp local-file
Show Tech output stored in local-file.  Please use 'copy show-tech local-file' to
copy-out this file.

switch# copy show-tech local-file ?
  REMOTE_URL   URL of syntax
               {tftp://|sftp://USER@}{IP|HOST}[:PORT][;blocksize=VAL]/FILE
  STORAGE_URL  URL of syntax usb:/file
switch# copy show-tech local-file
```

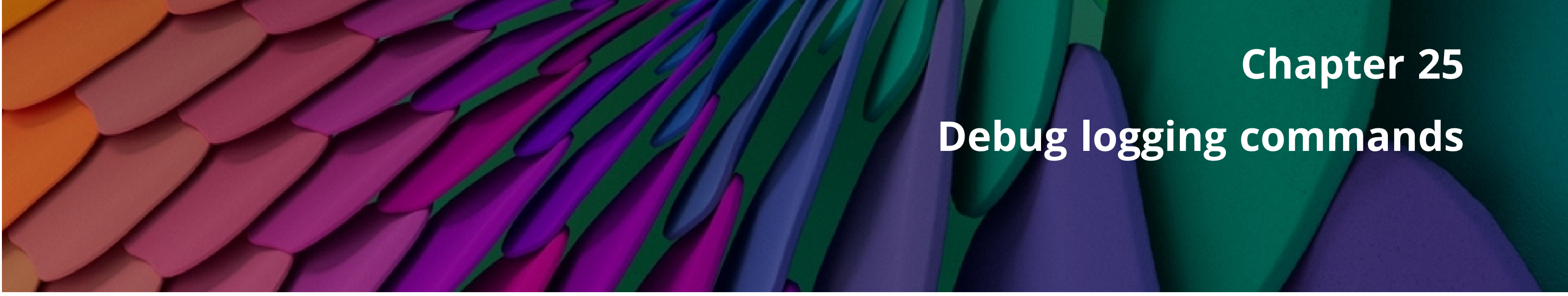
For more information on features that use this command, refer to the CoPP Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 25

Debug logging commands

clear debug buffer

`clear debug buffer`

Description

Clears all debug logs. Using the **show debug buffer** command will only display the logs generated after the **clear debug buffer** command.

Examples

Clearing all generated debug logs:

```
switch# show debug buffer
-----------------------------------------------------------------------------------
----------------------------
show debug buffer
-----------------------------------------------------------------------------------
----------------------------
2018-10-14:09:10:58.558710|lldpd|LOG_DEBUG|MSTR||LLDP|LLDP_CONFIG|No Port cfg
changes
2018-10-14:09:10:58.558737|lldpd|LOG_DEBUG|MSTR||LLDP|LLDP_EVENT|lldpd_stats_run
entered at time 8257199
2018-10-14:09:10:58.569317|lldpd|LOG_DEBUG|MSTR||LLDP|LLDP_CONFIG|No Port cfg
changes
2018-10-14:09:11:21.881907|hpe-sysmond|LOG_INFO|MSTR||SYSMON|SYSMON_CONFIG|Sysmon
poll interval changed to 32


switch# clear debug buffer
switch# show debug buffer
-----------------------------------------------------------------------------------
----------------------------
show debug buffer
-----------------------------------------------------------------------------------
----------------------------
2018-10-14:09:13:24.481407|hpe-sysmond|LOG_INFO|MSTR||SYSMON|SYSMON_CONFIG|Sysmon
poll interval changed to 51
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

debug {all | <MODULE-NAME>}

```
debug {all | <MODULE-NAME>} [<SUBMODULE-NAME>] [severity
   (emer|crit|alert|err|notice|warning|info|debug)] {port <PORT-NAME> |
    vlan <VLAN-ID> | ip <IP-ADDRESS> | mac <MAC-ADDRESS> |
    vrf <VRF-NAME> | instance <INSTANCE-ID>}
no debug {all | <MODULE-NAME>} [<SUBMODULE-NAME>] {port | vlan | ip | mac |
    vrf | instance}
```

Description

Enables debug logging for modules or submodules by name, with optional filtering by specific criteria.

The **no** form of this command disables debug logging.

Parameter	Description
`all`	Enables debug logging for all modules.
<MODULE-NAME>	Enables debug logging for a specific module. For a list of supported modules, enter the **debug** command followed by a space and a question mark (?).
<SUBMODULE-NAME>	Enables debug logging for a specific submodule. For a list of supported submodules, enter the **debug *<MODULE-NAME>*** command followed by a space and a question mark (?).
`severity (emer|crit|alert|err|notice|warning|info|debug)`	Selects the minimum severity log level for the destination. If a severity is not provided, the default log level is **debug**. Optional.
`emer`	Specifies storage of debug logs with a severity level of **emergency** only.
`crit`	Specifies storage of debug logs with severity level of **critical** and above.
`alert`	Specifies storage of debug logs with severity level of **alert** and above.
`err`	Specifies storage of debug logs with severity level of **error** and above.
`notice`	Specifies storage of debug logs with severity level of **notice** and above.
`warning`	Specifies storage of debug logs with severity level of **warning** and above.
`info`	Specifies storage of debug logs with severity level of **info** and above.

Parameter	Description
`debug`	Specifies storage of debug logs with severity level of **debug** (default).
`port`	Displays debug logs for the specified port, for example **1/1/1**.
`vlan <VLAN-ID>`	Displays debug logs for the specified VLAN. Provide a VLAN from 1 to 4094.
`ip <IP-ADDRESS>`	Displays debug logs for the specified IP Address.
`mac <MAC-ADDRESS>`	Displays debug logs for the specified MAC Address, for example **A:B:C:D:E:F**.
`vrf <VRF-NAME>`	Displays debug logs for the specified VRF.
`instance <INSTANCE-ID>`	Displays debug logs for the specified instance. Provide an instance ID from 1 to 255.

Examples

```
switch# debug all
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

debug db

```
debug db {all | sub-module} [level <MINIMUM-SEVERITY>] [filter]
```

```
no debug db {all | sub-module} [level <MINIMUM-SEVERITY>] [filter]
```

Description

Enables or disables debug logging for a db module or submodules, with an option to filter by specific criteria.

The **no** form of this command disables debug logging for the db module or submodule.

Parameter	Description
`all`	Enables all submodules for the db log.
`sub-module`	Enables debug logging for supported submodules. Specify **rx** or **tx** debug logs.
`filter`	Specifies supported filters for the db log. Specify **table**, **column**, or **client**. Optional
`severity (emer|crit|alert|err|notice|warning|info|debug)`	Selects the minimum severity log level for the destination. If a severity is not provided, the default log level is **debug**. Optional.
`emer`	Specifies storage of debug logs with a severity level of **emergency** only.
`crit`	Specifies storage of debug logs with severity level of **critical** and above.
`alert`	Specifies storage of debug logs with severity level of **alert** and above.
`err`	Specifies storage of debug logs with severity level of **error** and above.
`notice`	Specifies storage of debug logs with severity level of **notice** and above.
`warning`	Specifies storage of debug logs with severity level of **warning** and above.
`info`	Specifies storage of debug logs with severity level of **info** and above.
`debug`	Specifies storage of debug logs with severity level of **debug** (default).

Usage

DBlog is a high performance, configuration, and state database server logging infrastructure where a user can log the transactions which are sent or received by clients to the configuration and state database server. It can be enabled through the CLI and REST, and also supports filters where a user can filter out logs on the basis of table, column, or client. It is helpful for debugging when the user wants to debug an issue with a particular client, table, or column combination. It is not enabled by default. A combination of filters can also be applied to filter out messages based on table, column, and client.

There are three submodules for the "db" module:

1. **all**: When All is enabled, no filters are applied to any of the debug logs, even if other submodules are configured with filters.
2. **tx**: If enabled, only the replies and notifications sent out for the initial and incremental updates are logged.
3. **rx**: If enabled, only the transactions sent to the configuration and state database server are logged.

The keyword **all** may be used to enable or disable debug logging for all sub-modules. Also a combination of filters can be used to filter the message types.

If the table or client filter is applied, then the messages belonging to this specific table or client will be logged. The column filter can also be applied to further filter messages on a table, providing a mechanism to filter messages on a column. The table and client filter can be used in combination or separately, but column can only be used in conjunction with table.

Examples

Configuring all submodules with severity **debug**:

```
switch# debug db all severity debug
```

Configuring the **tx** submodule with **table Interface** filter and severity **debug**:

```
switch# debug db tx table Interface severity debug
```

Configuring the **rx** submodule with **table Interface column statistics** filter and severity **debug**:

```
switch# debug db rx table Interface column statistics severity debug
```

Disabling the **rx** submodule:

```
switch# no debug db rx
```

Disabling the **tx** submodule **table Interface**:

```
switch# no debug db tx table Interface
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

debug destination

```
debug destination {syslog | file | console | buffer} [severity
(emer|crit|alert|err|notice|warning|info|debug)]
no debug destination {syslog | file | console}
```

Description

Sets the destination for debug logs and the minimum severity level for each destination

The **no** form of this command unsets the destination for debug logs.

Parameter	Description
`{syslog | file | console | buffer}`	Selects the destination to store debug logs. Required.
`syslog`	Specifies that the debug logs are stored in the **syslog**.
`file`	Specifies that debug logs are stored in **file**.
`console`	Specifies that debug logs are stored in **console**.
`buffer`	Specifies that debug logs are stored in **buffer** (default).
`severity (emer|crit|alert|err| notice|warning|info|debug)`	Selects the minimum severity log level for the destination. If a severity is not provided, the default log level is**debug**. Optional.
`emer`	Specifies storage of debug logs with a severity level of **emergency** only.
`crit`	Specifies storage of debug logs with severity level of **critical** and above.
`alert`	Specifies storage of debug logs with severity level of **alert** and above.
`err`	Specifies storage of debug logs with severity level of **error** and above.
`notice`	Specifies storage of debug logs with severity level of **notice** and above.
`warning`	Specifies storage of debug logs with severity level of **warning** and above.
`info`	Specifies storage of debug logs with severity level of **info** and above.
`debug`	Specifies storage of debug logs with severity level of **debug** (default).

Usage

Events that have a severity equal to or higher than the configured severity level are stored in the designated destination. The product defaults to **buffer** for destination and **debug** as a severity level.

Examples

```
switch# debug destination syslog severity alert

switch# debug destination console severity info

switch# debug destination file severity warning
```

```
switch# debug destination buffer severity err
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show debug

```
show debug [vsx-peer]
```

Description

Displays the enabled debug types.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show debug
-----------------------------------------------------------------------------------
-
module sub_module severity vlan port    ip        mac                 instance  vrf

-----------------------------------------------------------------------------------
-
all     all          err    1   1/1/1   10.0.0.1  1a:2b:3c:4d:5e:6f   2
abcd
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show debug buffer

```
show debug buffer [module <MODULE-NAME> | severity
(emer|crit|alert|err|notice|warning|info|debug)]
```

Description

Displays debug logs stored in the specified debug buffer with optional filtering by module or severity.

Parameter	Description
`<MODULE-NAME>`	Filters debug logs displayed by the specified module name.
`severity (emer|crit|alert|err| notice|warning|info|debug)`	Displays debug logs with a specified severity level. Defaults to**debug**. Optional.
`emer`	Displays debug logs with a severity level of **emergency** only.
`crit`	Displays debug logs with a severity level of **critical** and above.
`alert`	Displays debug logs with a severity level of **alert** and above.
`err`	Specifies storage of debug logs with severity level of **error** and above.
`notice`	Specifies storage of debug logs with severity level of **notice** and above.
`warning`	Displays debug logs with a severity level of **warning** and above.
`info`	Displays debug logs with a severity level of **info** and above.
`debug`	Displays debug logs with a severity level of **debug** (default).

Examples

```
switch# show debug buffer

------------------------------------------------------------------------------
show debug buffer
------------------------------------------------------------------------------
2017-03-06:06:51:15.089967|hpe-sysmond|SYSMON|SYSMON_CONFIG|LOG_INFO|Sysmon poll
```

```
interval changed to 20
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show debug buffer vsf

Applicable for 6300 switches only.

```
show debug buffer vsf [member <MEMBER-ID>] [{conductor | standby}]
```

Description

Displays VSF member debug logs stored in the debug buffer, with an option to filter by VSF member and role.

Parameter	Description
<MEMBER-ID>	Displays debug logs for the specified member-id. Optional. Range: 1-10.
conductor	Display debug logs for the VSF conductor.
standby	Display debug logs for the VSF standby.

Examples

Displaying VSF member debug logs with member-id 1:

```
switch# show debug buffer vsf member 1
--------------------------------------------------------------------------------
show debug buffer
--------------------------------------------------------------------------------
2020-12-14:07:53:17.217919|hpe-ledarbd|LOG_DEBUG|MMBR|2|LED|LED|ledarbd_vsf_mbrs_
check: Checking VSF_Member table
```

Displaying VSF member debug logs for member state conductor:

```
switch# show debug buffer vsf conductor
-------------------------------------------------------------------------------
show debug buffer
-------------------------------------------------------------------------------
2020-12-14:07:54:20.469024|hpe-ledarbd|LOG_DEBUG|CDTR|1|LED|LED|ledarbd_pd_
subsystems_check: Checking Subsystem table
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.09	Updated parameter name for inclusive language
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Administrators or local user group members with execution rights for this command.

show debug destination

`show debug destination [vsx-peer]`

Description

Displays the configured debug destination and severity.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show debug destination
----------------------------------------------------------------------
show debug destination
----------------------------------------------------------------------
 CONSOLE:info
 FILE:warning
```

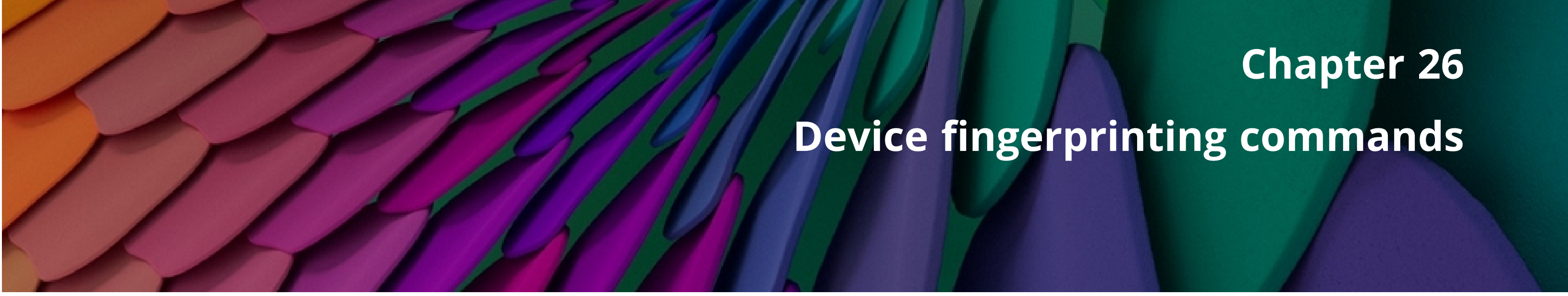
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 26

Device fingerprinting commands

cdp

```
cdp [tlv-name {chassis-id | address | port-id | capabilities | version | platform |
   native-vlan | duplex}] [tlv-num <TLV-NUMBER>]
no cdp [tlv-name {chassis-id | address | port-id | capabilities | version | platform |
   native-vlan | duplex}] [tlv-num <TLV-NUMBER>]
```

Description

Configures the CDP protocol attributes in the device fingerprinting profile context which the switch uses to collect information from the connected devices.

The **no** form of this command removes the CDP protocol configuration associated with the device fingerprinting profile.

Parameter	Description
`tlv-name`	Selects one of the available CDP TLV names. Default: **platform**.
<TLV-NUMBER>	Selects one of the available CDP TLV numbers. Supported values are 1 to 6, 10, and 11. Default: 6

Examples

Configuring the device fingerprinting profile **temp** using CDP with TLV name **capabilities** and TLV number **4**:

```
switch(config)# client device-fingerprint profile temp
switch(temp)# cdp tlv-name capabilities
switch(temp)# cdp tlv-num 4
```

Removing the device fingerprinting profile **temp** using CDP with TLV name **capabilities**:

```
switch(config)# client device-fingerprint profile temp
switch(temp)# no cdp tlv-name capabilities
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	*<DEVICE-FINGERPRINTING-PROFILE-NAME>*	Administrators or local user group members with execution rights for this command.

client device-fingerprint apply-profile

```
client device-fingerprint [apply-profile <PROFILE-NAME>]
no client device-fingerprint [apply-profile <PROFILE-NAME>]
```

Description

Associates a device fingerprinting profile on all interfaces. When a profile is configured on an interface, the configured profile will supersede the system-wide profile configuration.

The **no** form of this command removes the association of device fingerprinting profile from the ports.

The client-limit on the interface is governed by the configuration under the interface.

Parameter	Description
<PROFILE-NAME>	Specifies the name of the fingerprint profile. Range: Up to 128 characters.

Examples

Applying device fingerprinting profile named **frprnt01** at system level:

```
switch# configure
switch(config)# client device-fingerprint apply-profile fnprnt01
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	Command supported on all interfaces.
10.08	Command introduced for interface level.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

client device-fingerprint client-limit

```
client device-fingerprint [client-limit <LIMIT>]
no client device-fingerprint [client-limit <LIMIT>]
```

Description

Set a maximum client-limit supported on a port or port list. The client-limit can be configured under the interface context.The **no** form of this command will remove the client-limit from the particular port/portlist.

Parameter	Description
<LIMIT>	Specifies the maximum client limit for a port. Range: ▪ 6300: **1** to **2048.** Default is **256.** An individual interface on the switch can support 1-2048 clients, with a default value of 256 clients. ▪ 6400: **1** to **4096.** Default is **256.** An individual interface on the switch can support 1-4096 clients, with a default value of 256 clients.

Examples

Applying a client limit of **200** on the interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# client device-fingerprint client-limit 200
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

client device-fingerprint profile

```
client device-fingerprint profile <PROFILE-NAME>
no client device-fingerprint profile <PROFILE-NAME>
```

Description

Configures a device fingerprinting profile. You can configure a maximum of 32 profiles.

The **no** form of this command removes the device fingerprinting profile.

Parameter	Description
<PROFILE-NAME>	Specifies the name of the fingerprint profile. Range: Up to 128 characters.

Examples

Configuring fingerprint profile **fnprnt01**:

```
switch(config)# client device-fingerprint profile fnprnt01
```

Deleting the fingerprint profile **fnprnt01**:

```
switch(config)# no client device-fingerprint profile fnprnt01
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp

```
dhcp [option-num <OPTION-NUMBER>][options-list]
no dhcp [option-num <OPTION-NUMBER>][options-list]
```

Description

Configures the DHCP protocol attributes in the device fingerprinting profile context based on which the switch collects information from the connected devices. Default option numbers are 12, 55, and 60. The DHCP options-list is disabled by default. It can be manually enabled to extract the DHCP Options list in network order as they appear in a DHCP packet.

The **no** form of this command removes the DHCP protocol configuration associated with the device fingerprinting profile.

Parameter	Description
<OPTION-NUMBER>	Specifies the DHCP option number to match. Supported values are 1 to 255. Default option numbers: 12, 55, and 60.
[options-list]	Selects the DHCP options list for device fingerprinting.

Examples

Configuring the device fingerprinting profile **temp2** using DHCP with option **55**:

```
switch(config)# client device-fingerprint profile temp2
switch(config-device-fingerprint)# dhcp option-num 55
```

Removing the device fingerprinting profile **temp2** using **DHCP** with option **55**:

```
switch(config)# client device-fingerprint profile temp2
switch(config-device-fingerprint)# no dhcp option-num 55
```

Configuring the device fingerprinting profile **temp2** using DHCP default options and options-list:

```
switch(config)# client deivce-fingerprint profile temp2
switch(temp2)# dhcp options-list
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Added **options-list** parameter.
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	config-device-fingerprint	Administrators or local user group members with execution rights for this command.

http user-agent

```
http user-agent
no http user-agent
```

Description

Configures the HTTP protocol in the device fingerprinting profile context based on which the switch collects information from the connected devices.

The **no** form of this command removes the HTTP protocol configuration associated with the device fingerprinting profile.

As of AOS-CX release 10.10 information from the last 3 user agents is provided as part of the device fingerprinting solution.

Examples

Configuring the device fingerprinting profile **temp3** using HTTP:

```
switch(config)# client device-fingerprint profile temp3
switch(temp3)# http user-agent
```

Removing the device fingerprinting profile **temp3** using HTTP:

```
switch(config)# client device-fingerprint profile temp3
switch(temp3)# no http user-agent
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	*<DEVICE-FINGERPRINTING-PROFILE-NAME>*	Administrators or local user group members with execution rights for this command.

lldp (device fingerprinting)

```
lldp [tlv-name {chassis-id | port-id | time-to-live | port-description |
   system-name | system-description | system-capabilities |
   management-address}] [tlv-num <TLV-NUMBER>]
no lldp [tlv-name {chassis-id | port-id | time-to-live | port-description |
   system-name | system-description | system-capabilities |
   management-address}] [tlv-num <TLV-NUMBER>]
```

Description

Configures the LLDP protocol attributes in the device fingerprinting profile context based on which the switch collects information from the connected devices.

The **no** form of this command removes the LLDP protocol configuration associated with the device fingerprinting profile.

Parameter	Description
`tlv-name`	Selects one of the available LLDP TLV names. Default: **system-description**.
`<TLV-NUMBER>`	Selects one of the available LLDP TLV numbers. Supported values are 1 to 8. Default: 6

Examples

Configuring the device fingerprinting profile **temp1** using LLDP with TLV name **system-name** and TLV number **5**:

```
switch(config)# client deivce-fingerprint profile temp1
switch(temp1)# lldp tlv-name system-name
switch(temp1)# lldp tlv-num 5
```

Removing the device fingerprinting profile **temp1** using LLDP with TLV name **system-name**:

```
switch(config)# client device-fingerprint profile temp1
switch(temp1)# no lldp tlv-name system-name
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	*`<DEVICE-FINGERPRINTING-PROFILE-NAME>`*	Administrators or local user group members with execution rights for this command.

vsx-sync

```
vsx-sync
no vsx-sync
```

Description

Enables device fingerprint profile-level synchronization between primary to secondary switches in VSX.

The **no** form of this command disables device fingerprint profile-level synchronization between primary to secondary switches in VSX.

Examples

Enabling VSX synchronization at the device fingerprinting profile **fnprnt01**:

```
switch(config)# client device-fingerprint profile fnprnt01
switch(fnprnt01)# vsx-sync
```

Disabling VSX synchronization at the device fingerprinting profile **fnprnt01**:

```
switch(config)# client device-fingerprint profile fnprnt01
switch(fnprnt01)# no vsx-sync
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6400	*<DEVICE-FINGERPRINTING-PROFILE-NAME>*	Administrators or local user group members with execution rights for this command.

vsx-sync device-fingerprint

```
vsx-sync device-fingerprint
no vsx-sync device-fingerprint
```

Description

Enables synchronization of device fingerprinting configuration between primary to secondary switches at the interface level.

The **no** form of this command disables synchronization of device fingerprinting configuration between primary to secondary switches in VSX at the interface level.

Examples

Enabling VSX synchronization for device fingerprinting:

```
switch(config)# interface 1/1/1
switch(config-if)# vsx-sync device-fingerprint
```

Disabling VSX synchronization for device fingerprinting:

```
switch(config)# interface 1/1/1
switch(config-if)# no vsx-sync device-fingerprint
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if`	Administrators or local user group members with execution rights for this command.

show client device-fingerprint

`show client device-fingerprint <MAC-ADDRESS>`

Description

Shows fingerprinting attributes collected from all devices or a particular device using MAC address.

Parameter	Description
<MAC-ADDRESS>	Specifies the client MAC address.

Examples

Showing fingerprinting attributes collected from a device with MAC address **f8:40:f0:c9:70:40**:

```
switch (config)# show client device-fingerprint f8:60:f0:c9:70:40

Port        : 1/1/2
VLAN        : 30
Protocol : DHCP
   Host Name(12)                  : dut1
   Vendor-Class-Identifier(60) : Aruba JL678A
Protocol : HTTP
   User Agent1 : n/a
Protocol : LLDP
   Chassis-Name(1)              : 6100
   Chassis-Description(6)      : Aruba JL678A  PL.10.06.0001AAF-180-g9406d01
   System Capabilities(7)      : Bridge, Router
Protocol : CDP
   n/a
```

Showing fingerprinting attributes collected from all devices when the LLDP profile is not configured on port **1/1/1** and all the protocols are enabled on port **1/1/2**. CDP data was not collected on **1/1/2**, though it was configured:

```
switch (config)# show client device-fingerprint
Client MAC Address : f8:60:f0:c9:70:40
Port        : 1/1/1
VLAN        : 20

Protocol: DHCP
   Host Name(12)                : dut1
   Vendor-Class-Identifier(60) : Aruba JL678A
Protocol: HTTP
   User Agent1 : Aruba123
   User Agent2 : Aruba234
   User Agent3 : Aruba345
Protocol: LLDP
   n/a
Protocol: CDP
   Device-Id(1)       :  dut1
   Address(3)         :  10.1.1.2
   Platform(6)        :  cisco C9300-24T
   Version(5)         :  Cisco IOS Software [Gibraltar], Catal...
   Capabilities(4)    :  igmp_capable,router,switch

Client MAC Address : f8:40:f0:c9:70:40
Port        : 1/1/2
VLAN        : 30
Protocol : DHCP
   Host Name(12)                : dut1
   Vendor-Class-Identifier(60) : Aruba JL678A
Protocol : HTTP
   User Agent1 : ArubaCentral
   User Agent2 : Aruba234
Protocol : LLDP
   Chassis-Name(1)             : 6100
   Chassis-Description(6)      : Aruba JL678A  PL.10.06.0001AAF-180-g9406d01
   System Capabilities(7)      : Bridge, Router
Protocol: CDP
```

Showing fingerprinting attributes where all the protocols are enabled on port 1/1/3 along with DHCP options-list:

```
switch (config)# show client device-fingerprint
Client MAC Address : f8:40:f0:c9:70:50
Port        : 1/1/3
VLAN        : 40
Protocol : DHCP
   Host Name(12)                : dut1
   Vendor-Class-Identifier(60) : Aruba JL678A
   DHCP Options-List :
      Discover(1) : 53,116,61,50,12,60,55,255
      Request(3)  : 53,61,50,54,12,81,60,55,255
Protocol : HTTP
   User Agent1 : Aruba
Protocol : LLDP
   Chassis-Name(1)             : 6100
   Chassis-Description(6)      : Aruba JL678A  PL.10.06.0001AAF-180-g9406d01
   System Capabilities(7)      : Bridge, Router
Protocol: CDP
   Device-Id(1)       :  dut1
   Address(3)         :  10.1.1.2
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show client device-fingerprint active

`show client device-fingerprint active`

Description

Shows status details of device fingerprinting profiles associated with the ports. Displays the protocols that are configured for a profile and whether the profile is enabled or disabled at that port.

Examples

Showing details of device fingerprinting profiles:

```
switch (config)# show client device-fingerprint active
Port    Profile                  Status            DHCP  HTTP  LLDP CDP
-----------------------------------------------------------------------
1/1/1   profile1                 Configured         Y     Y     N    N
1/1/2   profile2                 Not configured     N     N     Y    Y
1/1/3   profile3                 Configured         N     Y     N    Y
System  profile4                 Configured         Y     Y     Y    N
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	Command output modified to displays details about all the interfaces.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show client device-fingerprint profile

```
show client device-fingerprint profile [<PROFILE-NAME>]
```

Description

Shows details of protocol configuration for device fingerprinting profiles.

Parameter	Description
<PROFILE-NAME>	Specifies the name of the fingerprint profile. Range: Up to 128 characters.

Examples

Showing details of protocol configuration for device fingerprinting profile **Profile1**:

```
switch (config)# show client device-profile Profile1
DHCP Attributes
  Option Numbers  : 12,50,55,60
  Options List    : Enable

HTTP Attributes
  User-Agent      : Enable

LLDP Attributes
  TLV Names       : chassis-id, system-description
  TLV Numbers     : 4,5,7

CDP Attributes
  TLV Names       : n/a
  TLV Numbers     : 1-3,6
```

For more information on features that use this command, refer to the Security Guide for your switch model.

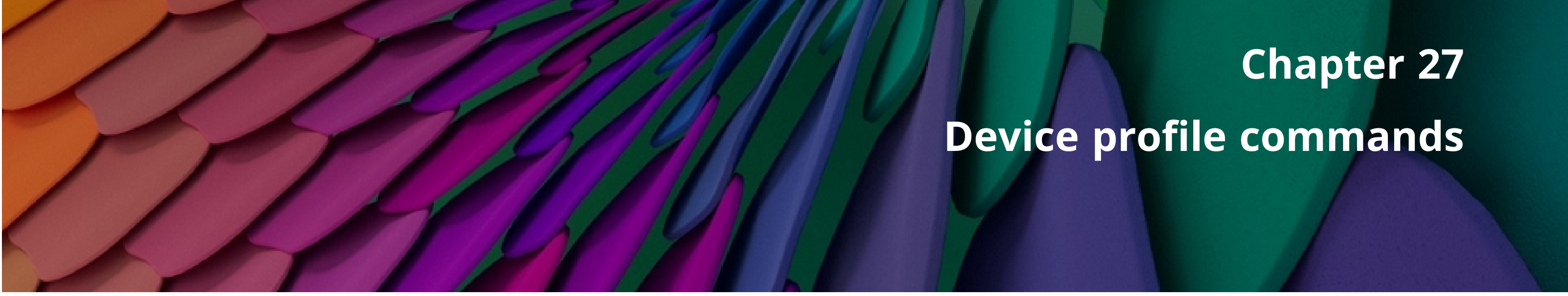
Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Operators or Administrators or local user group members with

Platforms	Command context	Authority
6400		execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 27

Device profile commands

aaa authentication port-access allow-cdp-auth

```
aaa authentication port-access allow-cdp-auth
no aaa authentication port-access allow-cdp-auth
```

Description

Use this command to allow or block authentication on the CDP (Cisco Discovery Protocol) BPDU (Bridge Protocol Data Unit) . This is allowed by default. The **no** form of this command prevents authentication on CDP packets received on the port. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

Examples

On the 6400 Switch Series, interface identification differs.

Allowing authentication on a CDP CPDU on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-cdp-auth
```

Allowing authentication on a CDP CPDU on a LAG port:

```
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access allow-cdp-auth
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access allow-cdp-bpdu

```
aaa authentication port-access allow-cdp-bpdu
no aaa authentication port-access allow-cdp-bpdu
```

Description

Allows all packets related to the CDP (Cisco Discovery Protocol) BPDU (Bridge Protocol Data Unit) on a secure port or LAG. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts. The **no** form of this command blocks the CDP BPDU on a secure port. On a nonsecure port, the command has no effect.

Examples

On the 6400 Switch Series, interface identification differs.

Allowing a CDP BPDU on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-cdp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000
led locator on
!
!
vlan 1
aaa authentication port-access mac-auth
    enable
aaa authentication port-access dot1x authenticator
    enable
interface 1/1/1
    no shutdown
    vlan access 1
    aaa authentication port-access allow-cdp-bpdu
    aaa authentication port-access mac-auth
        enable
    aaa authentication port-access dot1x authenticator
    enable

switch(config-if)# do show port-access device-profile interface all
Port 1/1/1, Neighbor-Mac 00:0c:29:9e:d1:20
    Profile Name    : access_switches
    LLDP Group      :
    CDP Group       : aruba-ap_cdp
    Role            : test_ap_role
    Status          : In Progress
    Failure Reason  :
```

Blocking LLDP packet on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access allow-cdp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000
led locator on
```

```
!
!
vlan 1
aaa authentication port-access mac-auth
    enable
interface 1/1/1
    no shutdown
    vlan access 1
    aaa authentication port-access mac-auth
        enable
```

Allowing a CDP BPDU on LAG **1**:

```
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access allow-cdp-bpdu
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access allow-cdp-proxy-logoff

```
aaa authentication port-access allow-cdp-proxy-logoff
no aaa authentication port-access allow-cdp-proxy-logoff
```

Description

Allows a client to be logged off from the system via a special TLV in the CDP packet. By default, proxy logoff via CDP packet support is disabled. When **allow-cdp-proxy-logoff** is enabled, TLV received from CDP packets corresponding to logoff processing will be read and logoff is issued to the clients. This only works on client authentication enabled ports and **aaa authentication port-access allow-cdp-bpdu** must be enabled to process. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

Examples

On the 6400 Switch Series, interface identification differs.

Allowing a client to be logged off from the system via a special TLV in the CDP packet:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-cdp-proxy-logoff
switch(config-if)# show running-config interface 1/1/1
interface 1/1/1
    no shutdown

    vlan access 1
    aaa authentication port-access allow-cdp-bpdu
    aaa authentication port-access allow-cdp-proxy-logoff
    aaa authentication port-access allow client-limit 2
    aaa authentication port-access dot1x authenticator
        enable
    aaa authentication port-accss mac-auth
        enable
    exit
```

The aaa authentication port-access allow-cdp-proxy-logoff command can also be issued from a LAG port context

```
switch(config)# interface lag 1
switch(config-lag if)# aaa authentication port-access allow-cdp-proxy-logoff
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.09.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access allow-lldp-bpdu

```
aaa authentication port-access allow-lldp-bpdu
no aaa authentication port-access allow-lldp-bpdu
```

Description

Allows all packets related to the LLDP BPDU (Bridge Protocol Data Unit) on a secure port. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

The **no** form of this command blocks the LLDP BPDU on a secure port. On a nonsecure port, the command has no effect.

Examples

On the 6400 Switch Series, interface identification differs.

Allowing an LLDP BPDU on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-lldp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000
led locator on
!
!
vlan 1
aaa authentication port-access mac-auth
    enable
interface 1/1/1
    no shutdown

    vlan access 1
    aaa authentication port-access allow-lldp-bpdu
    aaa authentication port-access mac-auth
        enable

switch(config-if)# do show port-access device-profile interface all
Port 1/1/1, Neighbor-Mac 00:0c:29:9e:d1:20
    Profile Name    : access_switches
    LLDP Group      : 2920-grp
    CDP Group       :
    Role            : local_2920_role
    Status          : Profile Applied
    Failure Reason  :
```

Blocking LLDP BPDU on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access allow-lldp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000led locator on
!
!
vlan 1
aaa authentication port-access mac-auth
    enable
interface 1/1/1
    no shutdown

    vlan access 1
    aaa authentication port-access mac-auth
    enable
```

Allowing an LLDP BPDU on a LAG port:

```
switch(config)# interface lag 1
switch(config-lag-if)#aaa authentication port-access allow-lldp-bpdu
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

associate cdp-group

```
associate cdp-group <GROUP-NAME>
no associate cdp-group <GROUP-NAME>
```

Description

Associates a CDP (Cisco Discovery Protocol) group with a device profile. A maximum of two CDP groups can be associated with a device profile.

The **no** form of this command removes a CDP group from a device profile.

Parameter	Description
<GROUP-NAME>	Specifies the name of the CDP group to associate with this device profile. Range: 1 to 32 alphanumeric characters.

Examples

Associating the CDP group **my-cdp-group** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate cdp-group my-cdp-group
```

Removing the CDP group **my-cdp-group** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate cdp-group my-cdp-group
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-device-profile`	Administrators or local user group members with execution rights for this command.

associate lldp-group

```
associate lldp-group <GROUP-NAME>
no associate lldp-group <GROUP-NAME>
```

Description

Associates an LLDP group with a device profile. A maximum of two LLDP groups can be associated with a device profile

The **no** form of this command removes an LLDP group from a device profile.

Parameter	Description
<GROUP-NAME>	Specifies the name of the LLDP group to associate with the device profile. Range: 1 to 32 alphanumeric characters.

Examples

Associating the LLDP group **my-lldp-group** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate lldp-group my-lldp-group
```

Removing the LLDP group **my-lldp-group** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate lldp-group my-lldp-group
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-device-profile`	Administrators or local user group members with execution rights for this command.

associate mac-group

```
associate mac-group <GROUP-NAME>
no associate mac-group <GROUP-NAME>
```

Description

Associates a MAC group with a device profile. A maximum of two MAC groups can be associated with a device profile.

The **no** form of this command removes a MAC group from a device profile.

Parameter	Description
<GROUP-NAME>	Specifies the name of the MAC group to associate with this device profile. Range: 1 to 32 alphanumeric characters.

Examples

Associating the MAC group **mac01-group** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate mac-group mac01-group
```

Removing the MAC group **mac01-group** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate mac-group mac01-group
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-device-profile`	Administrators or local user group members with execution rights for this command.

associate role

```
associate role <ROLE-NAME>
no associate role <ROLE-NAME>
```

Description

Associates a role with a device profile. Only one role can be associated with a device profile. For information on how to configure a role, see the port access role information in the *Security Guide*.

The **no** form of this command removes a role from a device profile.

Parameter	Description
<ROLE-NAME>	Specifies the name of the role to associate with the device profile. Range: 1 to 64 alphanumeric characters.

Examples

Associating the role **my-role** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate role my-role
```

Removing the role **my-role** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate role my-role
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-device-profile`	Administrators or local user group members with execution rights for this command.

disable

```
disable
no disable
```

Description

Disables a device profile.

The **no** form of this command enables a device profile.

Examples

Disabling a device profile:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# disable
```

Enabling a device profile named profile01:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no disable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-device-profile`	Administrators or local user group members with execution rights for this command.

enable

```
enable
no enable
```

Description

Enables a device profile.

The **no** form of this command disables a device profile.

Examples

Enabling a device profile:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# enable
```

Disabling a device profile named profile01:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-device-profile`	Administrators or local user group members with execution rights for this command.

ignore (for CDP groups)

```
ignore [seq <SEQ-NUM>] {platform <PLATFORM> | sw-version <SWVERSION> |
     voice-vlan-query <VLAN-ID>}
no ignore [seq <SEQ-ID>] {platform <PLATFORM> | sw-version <SWVERSION> |
     voice-vlan-query <VLAN-ID>}
```

Description

Defines a rule to ignore devices for a CDP (Cisco Discovery Protocol) group. Up to 64 match/ignore rules can be defined for a group.

The **no** form of this command removes a rule for ignoring devices from a CDP group.

Parameter	Description
`seq <SEQ-ID>`	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence.
`platform <PLATFORM>`	Specifies the hardware or model details of the neighbor. Range: 1 to 128 alphanumeric characters.
`sw-version <SWVERSION>`	Specifies the software version of the neighbor. Range: 1 to 128 alphanumeric characters.

Parameter	Description
`voice-vlan-query <VLAN-ID>`	Specifies the VLAN query value of the neighbor. Range: 1 to 65535.

Examples

Adding a rule to the CDP group **grp01** that ignores a device that transmits **PLATFORM01** in the platform TLV:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# ignore platform PLATFORM01
```

Adding a rule to the CDP group **grp01** that ignores a device that transmits **SWVERSION** in software version TLV:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# ignore sw-version SWVERSION
```

Removing the rule that matches the sequence number **25** from the CDP group named **grp01**.

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# no ignore seq 25
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-cdp-group`	Administrators or local user group members with execution rights for this command.

ignore (for LLDP groups)

```
ignore [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |
     vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
no ignore [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |
     vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
```

Description

Defines a rule to ignore devices for an LLDP group. Up to 64 match/ignore rules can be defined for a group.

The **no** form of this command removes a rule for ignoring devices from an LLDP group.

Parameter	Description
`seq <SEQ-ID>`	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence.
`sys-desc <SYS-DESC>`	Specifies the LLDP system description type-length-value (TLV). Range: 1 to 256 alphanumeric characters.
sysname *<SYS-NAME>*	Specifies the LLDP system name TLV. Range: 1 to 64 alphanumeric characters.
`vendor-oui <VENDOR-OUI>`	Specifies the LLDP system vendor OUI TLV. Range: 1 to 6 alphanumeric characters.
`type <KEY>`	Specifies the vendor OUI subtype key. Optional.
`value <VALUE>`	Specifies the vendor OUI subtype value. Range: 1 to 256 alphanumeric characters.

Examples

Adding a rule to the LLDP group **grp01** that ignores a device that transmits **PLATFORM01** in the system description TLV:

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# ignore sys-desc PLATFORM01
```

Removing the rule that matches the sequence number **25** from the LLDP group named **grp01**.

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# no match seq 25
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-lldp-group`	Administrators or local user group members with execution rights for this command.

ignore (for MAC groups)

```
[seq <SEQ-ID>] ignore {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}
no [seq <SEQ-ID>] ignore {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}
```

Description

Defines a rule to ignore devices for a MAC group based on the criteria of MAC address, MAC address mask, or MAC Organizational Unique Identifier (OUI). Up to 64 ignore rules can be defined for a group.

The **no** form of this command removes a rule for ignoring devices from a MAC group.

Parameter	Description
`seq` *`<SEQ-ID>`*	Specifies the entry sequence ID of the rule to create or modify a MAC group. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence. Range: **1** to **4294967295**.
`mac` *`<MAC-ADDR>`*	Specifies the MAC address of the device to ignore.
`mac-mask` *`<MAC-MASK>`*	Specifies the MAC address mask to ignore devices in that range. Supported MAC address masks: **/32** and **/40**.
`mac-oui` *`<MAC-OUI>`*	Specifies the MAC OUI to ignore devices in that range. Supports MAC OUI address of maximum length of 24 bits.

Usage

To achieve the required configuration of matches for devices, it is recommended to first ignore the devices that you do not want to add. Then match the criteria for the rest of the devices that you want to add to the MAC group.

For example, if you want to ignore a specific device but add all the other devices that belong to a MAC OUI, then you must first configure the ignore criteria with a lower sequence number. And then configure match criteria with a higher sequence number.

Examples

Adding a rule to the MAC group **grp01** to ignore a device based on MAC address, but match all other devices belonging to a MAC OUI:

```
switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac 1a:2b:3c:4d:5e:6f
switch(config-mac-group)# match mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
!
!
ssh server vrf mgmtdefault
!
```

~~~~
!
!
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
     seq 10 ignore mac 1a:2b:3c:4d:5e:6f
     seq 20 match mac-oui 1a:2b:3c

```
~~~~

Adding a rule to the MAC group **grp01** to ignore devices based on MAC address mask, but match all other devices belonging to a MAC OUI:

~~~~
switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac-mask 1a:2b:3c:4d/32
switch(config-mac-group)# match mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
!
!
ssh server vrf mgmtdefault
!
!
!
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
     seq 10 ignore mac-mask 1a:2b:3c:4d/32
     seq 20 match mac-oui 1a:2b:3c

```
~~~~

Adding a rule to the MAC group **grp01** that ignores a device based on complete MAC address:

~~~~
switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac 1a:2b:3c:4d:5e:6f
~~~~

Adding a rule to the MAC group **grp02** that ignores devices based on MAC mask:

~~~~
switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac-mask 1a:2b:3c:4d:5e/40
switch(config-mac-group)# ignore mac-mask 18:e3:ab:73/32
~~~~

Adding a rule to the MAC group **grp03** that ignores devices based on MAC OUI:

````
switch(config)# mac-group grp03
switch(config-mac-group)# ignore mac-oui 81:cd:93
````

Adding a rule to the MAC group **grp01** that ignores devices with a sequence number and based on MAC address:

~~~
switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 ignore mac b2:c3:44:12:78:11
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 ignore mac b2:c3:44:12:78:11

```
~~~

Removing the rule from the MAC group **grp01** based on sequence number:

~~~
switch(config)# mac-group grp01
switch(config-mac-group)# no ignore seq 10
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01

```
~~~

Adding a rule to the MAC group **grp01** that ignores devices with MAC entry sequence number and based on MAC OUI:

````
switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 ignore mac b2:c3:44:12:78:11
switch(config-mac-group)# seq 20 ignore mac-oui 1a:2b:3c
switch(config-mac-group)# seq 30 ignore mac-mask 71:14:89:f3/32
switch(config-mac-group)# exit
````

~~~
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
     seq 10 ignore mac b2:c3:44:12:78:11
     seq 20 ignore mac-oui 1a:2b:3c
     seq 30 ignore mac-mask 71:14:89:f3/32

```
~~~

Removing the rule from the MAC group **grp01** based on sequence number and MAC OUI:

~~~
switch(config)# mac-group grp01
switch(config-mac-group)# no seq 20 ignore mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
     seq 10 ignore mac b2:c3:44:12:78:11
     seq 30 ignore mac-mask 71:14:89:f3/32


```
~~~

Removing the rule that matches the sequence number **25** from the MAC group named **grp01**.

```
switch(config)# mac-group grp01
switch(config-mac-group)# no ignore seq 25
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-mac-group`	Administrators or local user group members with execution rights for this command.

mac-group

```
mac-group <MAC-GROUP-NAME>
no mac-group <MAC-GROUP-NAME>
```

Description

Creates a MAC group or modifies an existing MAC group. A MAC group is used to classify connected devices based on the MAC address details, such as mask or OUI.

A maximum of 32 MAC groups can be configured on the switch. A maximum of 2 MAC groups can be associated with a device profile. Each group accepts 64 match or ignore commands.

The **no** form of this command removes a MAC group.

Parameter	Description
<MAC-GROUP-NAME>	Specifies the name of the MAC group to create or modify. The maximum number of characters supported is 32.

Examples

Creating a MAC group named **grp01**:

```
switch(config)# mac-group grp01
switch(config-mac-group)# exit
```

Removing a MAC group named **grp01**:

```
switch(config)# no mac-group grp01
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

match (for CDP groups)

```
match [seq <SEQ-ID>] {platform <PLATFORM> | sw-version <SWVERSION> |
     voice-vlan-query <VLAN-ID>}
no match [seq <SEQ-ID>] {platform <PLATFORM> | sw-version <SWVERSION> |
     voice-vlan-query <VLAN-ID>}
```

Description

Defines a rule to match devices for a CDP group. A maximum of 32 CDP groups can be configured on the switch. Up to 64 match or ignore rules can be defined for each group.

The **no** form of this command removes a rule for adding devices to a CDP group.

Parameter	Description
`seq <SEQ-ID>`	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence.
`platform <PLATFORM>`	Specifies the hardware or model details of the neighbor. Range: 1 to 128 alphanumeric characters.
`sw-version <SWVERSION>`	Specifies the software version of the neighbor. Range: 1 to 128 alphanumeric characters.
`voice-vlan-query <VLAN-ID>`	Specifies the VLAN query value of the neighbor. Range: 1 to 65535.

Examples

Adding rules to match a Cisco device with a specific software version on VLAN **512** to the CDP group **grp01**:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# match platform CISCO
switch(config-cdp-group)# match sw-version 11.2(12)P
switch(config-cdp-group)# match voice-vlan-query 512
switch(config-cdp-group)# match seq 50 platform cisco sw-version 11.2(12)P voice-
vlan-query 512
switch(config-cdp-group)# exit
switch(config)# do show running-config

Current configuration:
!
!Version AOS-CX Virtual.10.0X.000
!export-password: default
led locator on
!
!
vlan 1
port-access cdp-group grp01
```

```
      seq 10 match platform CISCO
      seq 20 match sw-version 11.2(12)P
      seq 30 match voice-vlan-query 512
      seq 50 match platform cisco sw-version 11.2(12)P voice-vlan-query 512
```

Removing a rule that matches the sequence number **25** from the CDP group named **grp01**:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# no match seq 25
```

Adding a rule that matches the value of vendor-OUI **000b86** to the CDP group named **grp01**:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# match vendor-oui 000b86
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-cdp-group`	Administrators or local user group members with execution rights for this command.

match (for LLDP groups)

```
match [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |
     vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
no match [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |
     vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
```

Description

Defines a rule to match devices for an LLDP group. Up to 64 match/ignore rules can be defined for a group.

The **no** form of this command removes a rule.

Parameter	Description
`seq <SEQ-ID>`	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one

Parameter	Description
	rule matches the command entered, the rule with the lowest ID takes precedence.
`sys-desc <SYS-DESC>`	Specifies the LLDP system description type-length-value (TLV). Range: 1 to 256 alphanumeric characters.
`sysname <SYS-NAME>`	Specifies the LLDP system name TLV. Range: 1 to 64 alphanumeric characters.
`vendor-oui <VENDOR-OUI>`	Specifies the LLDP system vendor OUI TLV. Range: 1 to 6 alphanumeric characters.
`type <KEY>`	Specifies the vendor OUI subtype key.
`value  <VALUE>`	Specifies the vendor OUI subtype value. Range: 1 to 256 alphanumeric characters.

Examples

Adding rules that match the LLDP system description **ArubaSwitch** and system name **Aruba** to the LLDP group named **grp01**:

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# match sys-desc ArubaSwitch
switch(config-lldp-group)# match sysname Aruba
switch(config)# do show running-config

Current configuration:
!
!Version AOS-CX Virtual.10.0X.000
!export-password: default
led locator on
!
!
vlan 1
port-access lldp-group grp01
     seq 10 match sys-desc ArubaSwitch
     seq 20 match sysname Aruba
```

Removing a rule that matches the sequence number **25** from an LLDP group named **grp01**:

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# no match seq 25
```

Adding a rule that matches the value of vendor-OUI **000b86** with type of **1** to the LLDP group named **grp01**:

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# match vendor-oui 000b86 type 1
```

Adding a rule that matches the value of vendor-OUI **000c34** to the LLDP group named **grp01**:

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# match vendor-oui 000c34
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-lldp-group`	Administrators or local user group members with execution rights for this command.

match (for MAC groups)

```
[seq <SEQ-ID>] match {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}
no [seq <SEQ-ID>] match {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}
```

Description

Defines a rule to match devices for a MAC group based on the criteria of MAC address, MAC address mask, or MAC Organizational Unique Identifier (OUI). Up to 64 match rules can be defined for a group.

You must not configure the following special MAC addresses:

- Null MAC—For example, 00:00:00:00:00:00 or 00:00:00/32
- Multicast MAC
- Broadcast MAC—For example, ff:ff:ff:ff:ff:ff
- System MAC

Although the switch accepts these addresses, it will not process these addresses for the local MAC match feature.

The **no** form of this command removes a rule for adding devices to a MAC group.

The number of clients that can onboard based on the match criteria is configured in the **aaa authentication port-access client-limit** command. For information about this command, see the *Security Guide* for your switch.

Parameter	Description
`seq <SEQ-ID>`	Specifies the entry sequence ID of the rule to create or modify a MAC group. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which

Parameter	Description
	rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence. Range: **1** to **4294967295**.
`mac <MAC-ADDR>`	Specifies the MAC address of the device.
`mac-mask <MAC-MASK>`	Specifies the MAC address mask to add devices in that range. Supported MAC address masks: **/32** and **/40**.
`mac-oui <MAC-OUI>`	Specifies the MAC OUI to add devices in that range. Supports MAC OUI address of maximum length of 24 bits.

Examples

Adding a device to the MAC group **grp01** based on complete MAC address:

```
switch(config)# mac-group grp01
switch(config-mac-group)# match mac 1a:2b:3c:4d:5e:6f
switch(config-mac-group)# exit
```

Adding devices to the MAC group **grp02** based on MAC mask:

```
switch(config)# mac-group grp01
switch(config-mac-group)# match mac-mask 1a:2b:3c:4d:5e/40
switch(config-mac-group)# match mac-mask 18:e3:ab:73/32
switch(config-mac-group)# exit
```

Adding devices to the MAC group **grp03** based on MAC OUI:

```
switch(config)# mac-group grp03
switch(config-mac-group)# match mac-oui 81:cd:93
switch(config-mac-group)# exit
```

Adding devices to the MAC group **grp01** with MAC entry sequence number and based on MAC address:

```
switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 match mac b2:c3:44:12:78:11
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 match mac b2:c3:44:12:78:11
```

~~~
```
~~~

Removing devices from the MAC group **grp01** based on sequence number:

~~~
switch(config)# mac-group grp01
switch(config-mac-group)# no match seq 10
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01

```
~~~

Adding devices to the MAC group **grp01** with MAC entry sequence number and based on MAC address, MAC address mask, and MAC OUI:

~~~
switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 match mac b2:c3:44:12:78:11
switch(config-mac-group)# seq 20 match mac-oui 1a:2b:3c
switch(config-mac-group)# seq 30 match mac-mask 71:14:89:f3/32
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
     seq 10 match mac b2:c3:44:12:78:11
     seq 20 match mac-oui 1a:2b:3c
     seq 30 match mac-mask 71:14:89:f3/32

```
~~~

Removing devices from the MAC group **grp01** based on MAC OUI:

```
switch(config)# mac-group grp01
switch(config-mac-group)# no seq 20 match mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
```

~~~
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
     seq 10 match mac b2:c3:44:12:78:11
     seq 30 match mac-mask 71:14:89:f3/32


```
~~~

Adding devices to the MAC group **grp03** with MAC entry sequence number and based on MAC address mask:

~~~
switch(config)# mac-group grp03
switch(config-mac-group)# seq 10 match mac-mask 10:14:a3:b7:55/40
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp03
     seq 10 match mac-mask 10:14:a3:b7:55/40

```
~~~

Removing devices from the MAC group **grp03** based on MAC address mask:

```
switch(config)# mac-group grp03
switch(config-mac-group)# no seq 10 match mac-mask 10:14:a3:b7:55/40
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp03
```

~~~
```
~~~

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-mac-group`	Administrators or local user group members with execution rights for this command.

port-access cdp-group

```
port-access cdp-group <CDP-GROUP-NAME>
no port-access cdp-group <CDP-GROUP-NAME>
```

Description

Creates a CDP (Cisco Discovery Protocol) group or modifies an existing CDP group. A CDP Group is used to classify connected devices based on the CDP packet details advertised by the device. A maximum of 32 CDP groups can be configured on the switch. Each group accepts 64 match/ignore commands.

The **no** form of this command removes a CDP group.

Parameter	Description
<CDP-GROUP-NAME>	Specifies the name of the CDP group to create or modify. The maximum number of characters supported is 32. Required.

Examples

Creating a CDP group named grp01:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# match platform CISCO
switch(config-cdp-group)# match sw-version 11.2(12)P
switch(config-cdp-group)# match voice-vlan-query 512
switch(config-cdp-group)# seq 50 match platform cisco sw-version 11.2(12)P voice-
vlan-query 512
switch(config-cdp-group)# exit
switch(config)# do show running-config

Current configuration:
!
```

```
!Version AOS-CX Virtual.10.0X.000
!export-password: default
led locator on
!
!
vlan 1
port-access cdp-group grp01
     seq 10 match platform CISCO
     seq 20 match sw-version 11.2(12)P
     seq 30 match voice-vlan-query 512
     seq 50 match platform cisco sw-version 11.2(12)P voice-vlan-query 512
```

Removing a CDP group named grp01:

```
switch(config)# no port-access cdp-group grp01
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

port-access device-profile

```
port-access device-profile <DEVICE-PROFILE-NAME>
no port-access device-profile <DEVICE-PROFILE-NAME>
```

Description

Creates a new device profile and switches to the **config-device-profile** context. A maximum of 32 device profiles can be created. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

The **no** form of this command removes a device profile.

Parameter	Description
<DEVICE-PROFILE-NAME>	Specifies the name of a device profile. Range: 1 to 32 alphanumeric characters.

Examples

Creating a device profile named **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)#
```

Removing a device profile named **profile01**:

```
switch(config)# no port-access device-profile profile01
```

Creating a device profile named **profile02** on a LAG port:

```
switch(config)#interface lag 1
switch(config-lag-if)# port-access device-profile profile01
switch(config-device-profile)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-if`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

port-access device-profile mode block-until-profile-applied

You must configure this mode in device profile only on standalone ports where there is no security configured and when you not want the port to be offline until one client is onboarded.

```
port-access device-profile mode block-until-profile-applied
no port-access device-profile mode block-until-profile-applied
```

Description

Configures the switch to block the port until a profile match occurs for a device. This configuration is required when no security feature is enabled on the port.

You must enable this mode or security on the port for local MAC match feature to operate. You must not enable both features on the same port at the same time.

You must not combine any other AAA configurations with the block-until-profile-applied mode.

This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts. The **no** form of this command removes a rule for adding devices to a MAC group.

Example

On the 6400 Switch Series, interface identification differs.

Configuring block-until-profile applied mode on port 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access device-profile
switch(config-if-deviceprofile)# mode block-until-profile-applied
switch(config-if-deviceprofile)# end
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-deviceprofile`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

port-access lldp-group

```
port-access lldp-group <LLDP-GROUP-NAME>
no port-access lldp-group <LLDP-GROUP-NAME>
```

Description

Creates an LLDP group or modifies an existing LLDP group. An LLDP group is used to classify connected devices based on the LLDP type-length-values (TLVs) advertised by the device. A maximum of 32 LLDP groups can be configured on the switch. Each group accepts 64 match/ignore commands.

The **no** form of this command removes an LLDP group.

Parameter	Description
<LLDP-GROUP-NAME>	Specifies the name of the LLDP group to create or modify. The maximum number of characters supported is 32. Required.

Examples

Creating an LLDP group named grp01:

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)#
```

Removing an LLDP group named grp01:

```
switch(config)# no port-access lldp-group grp01
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

show port-access device-profile

```
show port-access device-profile [[interface {all | <INTERFACE-ID>}
     [client-status <MAC-ADDR>]] | name <DEVICE-PROFILE-NAME>]
```

Description

Shows the client status for a specific MAC address or profile name.

Parameter	Description
interface {all | *<INTERFACE-ID>*}	Select **all** for all interfaces or specify the name of an interface in the format: **member/slot/port**.
client-status *<MAC-ADDR>*	Specifies a MAC address (**xx:xx:xx:xx:xx:xx**), where **x** is a hexadecimal number from 0 to F.
name *<DEVICE-PROFILE-NAME>*	Specifies the name of the device profile.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the applied state of the device profiles:

```
switch# show port-access device-profile

    Profile Name    : accesspoints
    LLDP Groups     : 2920-grp
    CDP Groups      :
    MAC Groups      : 2920-mac-grp1,2920-iot-grp2
    Role            : local_role_1
    State           : Enabled

    Profile Name    : access_switches
    LLDP Groups     : 2920-grp
    CDP Groups      :
    MAC Groups      :
    Role            : local_2920_role
    State           : Enabled

    Profile Name    : iot_devices
    LLDP Groups     :
    CDP Groups      :
    MAC Groups      : iot_camera-grp1,iot_sensors-grp1
    Role            : local_2920_role
    State           : Enabled

    Profile Name    : lobbyaps
    LLDP Groups     :
    CDP Groups      : lobby_ap_cdp_grp
    MAC Groups      :
    Role            : test_ap_role
    State           : Disabled
```

Showing the applied state of the device profile on interface 1/1/3:

```
switch# show port-access device-profile interface 1/1/3 client-status
00:0c:29:9e:d1:20

Port 1/1/3, Neighbor-Mac  00:0c:29:9e:d1:20
    Profile Name    : lobbyaps
    LLDP Group      :
    CDP Group       : aruba-ap_cdp
    MAC Group       :
    Role            : test_ap_role
    Status          : Failed
    Failure Reason  : Failed to apply MAC based VLAN
```

Showing the applied state of a specific device profile:

```
switch# show port-access device-profile name lldp-group

    Profile Name            : lldp-group
    LLDP Groups             :
    CDP Groups              :
    MAC Groups              : pc-behind-phone, lldp
    Role                    : auth_role
    State                   : Enabled
```

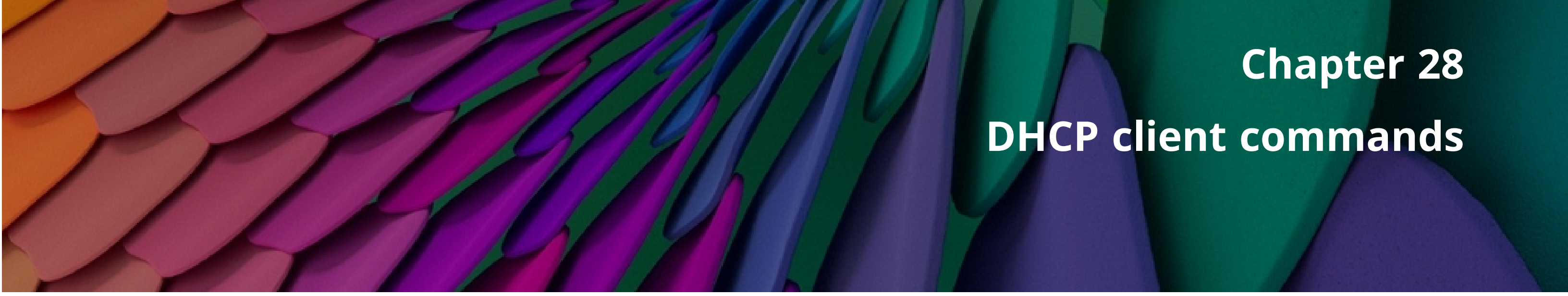
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 28

DHCP client commands

ip dhcp

```
ip dhcp
no ip dhcp
```

Description

Enables the DHCP client on the management interface or any interface VLAN to automatically obtain an IP address from a DHCP server on the network. By default, the DHCP client is enabled on the management interface and VLAN 1.

The **no** form of the command disables DHCP mode and is supported only on interface VLANs; it is not supported on the management interface.

Examples

Enabling the DHCP client on the management interface:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# ip dhcp
switch(config-if-mgmt)# no shutdown
```

Enabling the DHCP client on the interface vlan 1:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip dhcp
switch(config-if-vlan)# no shutdown
```

Disabling the DHCP client on the interface vlan 1:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip dhcp
```

Enabling the DHCP client on the interface vlan 4 under non-default VRF:

```
switch(config)# interface vlan 4
switch(config-if-vlan)# vrf attach red
switch(config-if-vlan)# ip dhcp
```

If the interface is not enabled, you can enable it by entering the `no shutdown` command.

`ip dhcp` is supported only on one vlan at a time.

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-mgmt` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip dhcp option

```
ip dhcp option [host-name | broadcast-flag]
no ip dhcp option[host-name | broadcast-flag]
```

Description

This command enables the DHCP client host name and broadcast flag globally.

If the **ip dhcp option broadcast-flag** command is enabled, then the DHCP offer and ack packets in the DHCP requests will be treated as broadcast packets. These packets will not be forwarded due to the presence of a default static route.

The **no** form of this command globally disables the host name and DHCP client broadcast flag options.

The **ip dhcp option broadcast-flag** command should be configured before configuring the **ip dhcp** command.

Example

Enabling the DHCP client broadcast flag globally:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip dhcp option broadcast-flag
```

Enabling the DHCP client host name globally:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip dhcp option host-name
```

Disabling the DHCP client broadcast flag globally:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip dhcp option broadcast-flag
```

Disabling the DHCP client host name globally:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip dhcp option host-name
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command Introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-mgmt` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

show ip dhcp

```
show ip dhcp
```

Description

Displays DHCP IPv4 information on the ports.

Examples

Displaying the DHCP IPv4 information on the ports:

```
switch# show ip dhcp
DHCP Options: Broadcast-flag, Hostname

INTERFACE-NAME   ADDRESS          DEFAULT_GATEWAY   DOMAIN_NAME   VRF      DNS-SERVERS
--------------------------------------------------------------------------------------------
-------------
vlan1            10.254.239.10/27                   domain.com    default   50.0.0.2,
50.0.0.3, 50.0.0.4
```

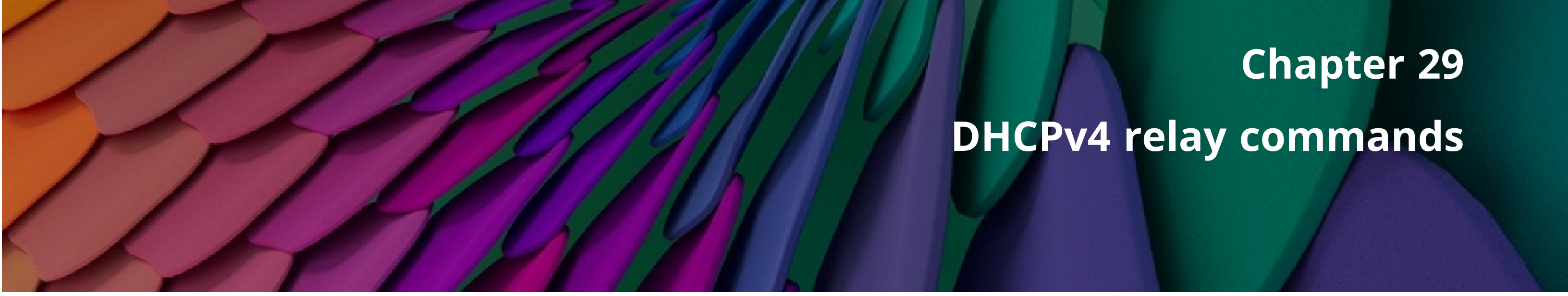
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.13.1000	The output parameters, **Broadcast-flag** and **Hostname** were introduced.
10.09 or earlier	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 29
DHCPv4 relay commands

dhcp-relay

```
dhcp-relay
no dhcp-relay
```

Description

Enables DHCP relay support. DHCP relay is enabled by default. DHCP relay is not supported on the management interface.

The **no** form of this command disables DHCP relay (and DHCP relay option 82) support.

Examples

This example enables DHCP relay support.

```
switch(config)# dhcp-relay
```

This example removes DHCP relay support.

```
switch(config)# no dhcp-relay
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-relay hop-count-increment

```
dhcp-relay hop-count-increment
no dhcp-relay hop-count-increment
```

Description

Enables the DHCP relay hop count increment feature, which causes the DHCP relay agent to increment the hop count in all relayed DHCP packets. Hop count is enabled by default.

The **no** form of this command disables the hop count increment feature.

Examples

Enabling the hop count increment feature.

```
switch(config)# dhcp-relay hop-count-increment
```

Disabling the hop count increment feature.

```
switch(config)# no dhcp-relay hop-count-increment
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-relay l2vpn-clients

```
dhcp-relay l2vpn-clients
no dhcp-relay l2vpn-clients
```

Description

Enables forwarding of packets from L2 VPN clients. Forwarding is enabled by default. Best practices is to disable this configuration on all the VXLAN tunnel endpoints (VTEPs), to avoid forwarding duplicate DHCP requests to the server.

The **no** form of this command disables forwarding of packets from L2 VPN clients.

Usage

In Asymmetric/Symmetric Integrated Routing and Bridging (IRB) VXLAN deployments with a VLAN extension in subset of VTEPs , client DHCP broadcast requests are received by all the VTEPS where a client VLAN is configured. A DHCP-Relay agent on those VTEPs forward DHCP packets to configured DHCP server(s). As DHCP requests are forwarded by multiple DHCP relay agents, the DHCP server receives duplicate copies of the same packet. When this configuration is disabled, the DHCP relay agent on VTEPs ignores DHCP request packets that are received from client MACs addresses learned via EVPN.

Example

Enabling forwarding of packets from L2 VPN clients.

```
switch(config)# dhcp-relay l2vpn-clients
switch(config)# no dhcp-relay l2vpn-clients
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-relay option 82

```
dhcp-relay option 82 {replace [validate] | drop [validate] |
               keep | source-interface | validate [replace | drop]} [ip | mac]
no dhcp-relay option 82 {replace [validate] | drop [validate] |
               keep | source-interface | validate [replace | drop]} [ip | mac]
```

Description

Configures the behavior of DHCP relay option 82. A DHCP relay agent can receive a message from another DHCP relay agent having option 82. The relay information from the previous relay agent is replaced by default.

The **no** form of this command disables the DHCP relay option 82 configurations. Option 82 is disabled when DHCP relay is disabled globally. When DHCP relay is re-enabled, option 82 also needs to be re-enabled using the **dhcp-relay option 82** command.

DHCP Relay is supported over VXLAN with both IPv4 and IPv6 underlay.

Parameter	Description
`replace`	Replace the existing option 82 field in an inbound client DHCP packet with the information from the switch. The remote ID and circuit ID information from the first relay agent is lost. Default.
`validate`	Validate option 82 information in DHCP server responses and drop invalid responses.
`drop`	Drop any inbound client DHCP packet that contains option 82

Parameter	Description
	information.
`keep`	Keep the existing option 82 field in an inbound client DHCP packet. The remote ID and circuit ID information from the first relay agent is preserved.
`source-interface`	Configures the DHCP relay to use a configured source IP address for inter-VRF server reachability. Set the source IP address with the command `ip source-interface`.
`ip`	Use the IP address of the interface on which the client DHCP packet entered the switch as the option 82 remote ID.
`mac`	Use the MAC address of the switch as the option 82 remote ID. Default.

Example

This example enables DHCP option 82 support and replaces all option 82 information with the values from the switch, with the switch MAC address as the remote ID.

```
switch(config)# dhcp-relay option 82 replace mac
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-smart-relay

```
dhcp-smart-relay
no dhcp-smart-relay
```

Description

Enables DHCP Smart Relay on the device and on all the interfaces where IP helper addresses are configured. Disabled by default at the device level. Not supported on the management interface.

The **no** form of this command disables DHCP Smart Relay.

Prior to enabling DHCP Smart Relay, enable IP helper address configuration and configure secondary IP addresses on the interface.

Examples

Enabling DHCP Smart Relay:

```
switch(config)# dhcp-smart-relay
```

Disabling DHCP Smart Relay support:

```
switch(config)# no dhcp-smart-relay
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

diag-dump dhcp-relay basic

`diag-dump dhcp-relay basic`

Description

Dumps DHCP relay configurations for all interfaces.

Examples

This example enables DHCP relay support.

```
switch# diag-dump dhcp-relay basic
==========================================================================
[Start] Feature dhcp-relay Time : Sun Apr 26 06:38:10 2020
==========================================================================
--------------------------------------------------------------------------
[Start] Daemon hpe-relay
--------------------------------------------------------------------------
DHCP Relay : 1
DHCP Relay hop-count-increment : 1
DHCP Relay Option82 : 1
DHCP Relay Option82 validate : 0
DHCP Relay Option82 policy : keep
DHCP Relay Option82 remote-id : mac
DHCP Relay Option82 Source Intf : Disable
DHCP Smart Relay : Enable
System Mac [f4:03:43:80:27:00]
VRF :BLUE, Source Ip:200.0.0.10
vsx: Not Present

Interface vlan2: 1

  Client Packet Statistics:

  Valid        Dropped      O82_Valid    O82_Dropped   vsx_drops
  -----        -------      ---------    -----------   ---------
  0            0            0            0             0

  Server Packet Statistics:

  Valid        Dropped      O82_Valid    O82_Dropped   Invalid_IP_Drops   To_
Dsnoop
  -----        -------      ---------    -----------   ----------------   --------
-
  0            0            0            0             0                  0
client request dropped packets with extn option 82 = 0
client request valid packets with extn option 82 = 0
server request dropped packets with extn option 82 = 0
server request valid packets with extn option 82 = 0
Port 67 - 200.0.0.100,2
source vrf-BLUE.

Interface vlan3: 1

  Client Packet Statistics:

  Valid        Dropped      O82_Valid    O82_Dropped   vsx_drops
  -----        -------      ---------    -----------   ---------
  0            0            0            0             0

  Server Packet Statistics:

  Valid        Dropped      O82_Valid    O82_Dropped   Invalid_IP_Drops   To_
Dsnoop
  -----        -------      ---------    -----------   ----------------   --------
-
  0            0            0            0             0                  0
client request dropped packets with extn option 82 = 0
client request valid packets with extn option 82 = 0
server request dropped packets with extn option 82 = 0
server request valid packets with extn option 82 = 0
Port 67 - 200.0.0.100,2
source vrf-BLUE.

DHCP Smart Relay Client Cache:
Total Number of entries: 2
--------------------------------------------------------------------------
Client-MAC         PortIndex   Timestamp   RetryCount  DiscCount  GWIP
--------------------------------------------------------------------------
00:50:56:bd:6a:7a  20          1636105218  1           4          30.0.0.1
00:50:56:bd:71:17  20          1636105214  1           4          30.0.0.1
```

```
-------------------------------------------------------------------------
[End] Daemon hpe-relay
-------------------------------------------------------------------------
=========================================================================
[End] Feature dhcp-relay
=========================================================================
Diagnostic-dump captured for feature dhcp-relay
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ip bootp-gateway

```
ip bootp-gateway <IPV4-ADDR>
no ip bootp-gateway <IPV4-ADDR>
```

Description

Configures a gateway address for the DHCP relay agent to use for DHCP requests. By default DHCP relay agent picks the lowest-numbered IP address on the interface.

The **no** form of this command removes the gateway address.

Parameter	Description
<IPV4-ADDR>	Specifies the IP address of the gateway in IPv4 format (**x.x.x.x**), where **x** is a is a decimal number from 0 to 255.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the IP address of the gateway for interface 1/1/1 to 10.10.10.10:

```
switch(config)# interface 1/1/1
switch(config-if)# ip bootp-gateway 10.10.10.10
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

ip helper-address

```
ip helper-address <IPV4-ADDR> [vrf <VRF-NAME>]
no ip helper-address <IPV4-ADDR> [vrf <VRF-NAME>]
```

Description

Defines the address of a remote DHCP server or DHCP relay agent. Up to eight addresses can be defined. The DHCP relay agent forwards DHCP client requests to all defined servers.

If IP helper adddress is defined with VRF argument then this command requires you define a source IP address for DHCP relay with the command `ip source-interface`. The configured source IP on the VRF is used to forward DHCP packets to the server.

A helper address cannot be defined on the OOBM interface.

The **no** form of this command removes an IP helper address.

Parameter	Description
`helper-address <IPV4-ADDR>`	Specifies the helper IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: `default`.

Examples

On the 6400 Switch Series, interface identification differs.

Defining the IP helper address 10.10.10.209 on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# ip helper-address 10.10.10.209
```

Removing the IP helper address 10.10.10.209 on interface 1/1/1:

```
switch(config-if)# no ip helper-address 10.10.10.209
```

Defining the IP helper address 10.10.10.209 on interface 1/1/2 on VRF myvrf:

```
switch(config)# interface 1/1/2
switch(config-if)# ip helper-address 10.10.10.209 vrf myvrf
```

Removing the IP helper address **10.10.10.209** on interface **1/1/2** on VRF `myvrf`:

```
switch(config-if)# no ip helper-address 10.10.10.209 vrf myvrf
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show dhcp-relay

`show dhcp-relay [vsx-peer]`

Description

Shows DHCP relay configuration settings.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing DHCP relay settings:

```
switch# show dhcp-relay

 DHCP Relay Agent                  : enabled
 DHCP Request Hop Count Increment : enabled
 L2VPN Clients                     : disabled
 Option 82                         : disabled
 Source-Interface                  : disabled
```

```
Response Validation              : disabled
Option 82 Handle Policy          : replace
Remote ID                        : mac

DHCP Relay Statistics:

 Valid Requests Dropped Requests Valid Responses Dropped Responses
 -------------- ---------------- --------------- -----------------
 60             10               60              10

DHCP Relay Option 82 Statistics:

 Valid Requests Dropped Requests Valid Responses Dropped Responses
 -------------- ---------------- --------------- -----------------
 50             8                50              8
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcp-relay bootp-gateway

`show dhcp-relay bootp-gateway [interface <INTERFACE-NAME>] [vsx-peer]`

Description

Shows the bootp gateway defined for all interfaces or a specific interface.

Parameter	Description
<INTERFACE-NAME>	Specifies an interface. Format: `member/slot/port`.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the designated bootp gateway for all interfaces:

```
switch# show dhcp-relay bootp-gateway

 BOOTP Gateway Entries

 Interface             Source IP
 -------------------- ---------------
 1/1/1                 1.1.1.1
 1/1/2                 1.1.1.2
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip helper-address

`show ip helper-address [interface <INTERFACE-ID>] [vsx-peer]`

Description

Shows the IP helper addresses defined for all interfaces or a specific interface.

Parameter	Description
`interface <INTERFACE-ID>`	Specifies an interface. Format: `member/slot/port`.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the IP helper addresses for all interfaces:

```
switch# show ip helper-address
 IP Helper Addresses

 Interface: 1/1/1
```

```
  IP Helper Address     VRF
  -----------------     -----------------
  192.168.20.1          default
  192.168.10.1          default

 Interface: 1/1/2
  IP Helper Address     VRF
  -----------------     -----------------
  192.168.30.1          RED
```

Showing the IP helper addresses for interface 1/1/1:

```
switch# show ip helper-address interface 1/1/1
 IP Helper Addresses

 Interface: 1/1/1
  IP Helper Address     VRF
  -----------------     -----------------
  192.168.20.1          default
  192.168.10.1          default
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 30

DHCP relay (IPv6) commands

dhcpv6-relay

```
dhcpv6-relay [l2vpn-clients|source-interface]
no dhcpv6-relay [l2vpn-clients|source-interface]
```

Description

Enables DHCPv6 relay support. DHCPv6 relay is disabled by default. DHCP relay is not supported on the management interface. Best practices is to disable this configuration on all the VXLAN tunnel endpoints (VTEPs), to avoid forwarding duplicate DHCPv6 requests to the server.

The **no** form of this command disables DHCP relay support.

DHCPv6 Relay requires that you configure the egress interface using the **ipv6 helper-address** command. The egress interface of a VTEP is used as an underlay, so a DHCPv6 Relay Multicast ipv6 address is not supported in a VXLAN topology.

Parameter	Description
`l2vpn-clients`	Enables packets from l2vpn clients to be forwarded to configured servers. Enabled by default.
`source-interface`	Enables DHCPv6 relay to use the configured source interface.

Usage

In Asymmetric/Symmetric Integrated Routing and Bridging (IRB) VXLAN deployments with a VLAN extension in subset of VTEPs , client DHCPv6 broadcast requests are received by all the VTEPS where a client VLAN is configured. A DHCPv6 relay agent on those VTEPs forward DHCPv6 packets to configured DHCPv6 server(s). As DHCPv6 requests are forwarded by multiple DHCPv6 relay agents, the DHCPv6 server receives duplicate copies of the same packet. When this configuration is disabled, the DHCPv6 relay agent on VTEPs ignores DHCPv6 request packets that are received from client MACs addresses learned via EVPN.

Examples

Enables DHCPv6 relay support.

```
switch(config)# dhcpv6-relay
```

Removes DHCPv6 relay support.

```
switch(config)# no dhcpv6-relay
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.12.1000	**l2vpn-clients** and **source-interface** added.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcpv6-relay option 79

```
dhcpv6-relay option 79
no dhcpv6-relay option 79
```

Description

Enables support for DHCP relay option 79. When enabled, the DHCPv6 relay agent forwards the link-layer address of the client. This option is disabled by default.

The **no** form of this command disables support for DHCP relay option 79.

Examples

Enables DHCP option 79 support.

```
switch(config)# dhcpv6-relay option 79
```

Disables DHCP option 79 support.

```
switch(config)# no dhcpv6-relay option 79
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ipv6 helper-address

```
ipv6 helper-address unicast <UNICAST-IPV6-ADDR>
no ipv6 helper-address unicast <UNICAST-IPV6-ADDR>
ipv6 helper-address multicast {all-dhcp-servers | <MULTICAST-IPV6-ADDR>} egress <PORT-NUM>
no ipv6 helper-address multicast {all-dhcp-servers | <MULTICAST-IPV6-ADDR>} egress <PORT-NUM>
```

Description

Defines the address of a remote DHCPv6 server or DHCPv6 relay agent. Up to eight addresses can be defined. The DHCPv6 agent forwards DHCPv6 client requests to all defined servers.

Not supported on the OOBM interface.

The **no** form of this command removes an IP helper address.

Parameter	Description
<UNICAST-IPV6-ADDR>	Specifies the unicast helper IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where **x** is a hexadecimal number from 0 to F.
<MULTICAST-IPV6-ADDR>	Specifies the multicast helper IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where **x** is a hexadecimal number from 0 to F.
all-dhcp-servers	Specifies all the DHCP server IPv6 addresses for the interface.
egress *<PORT-NUM>*	Specifies the port number on which DHCPv6 service requests are relayed to a multicast destination. The egress port must be different than the one on which the multicast helper address is configured. Format: member/slot/port.
vrf *<VRF-NAME>*	Specifies the name of the VRF from which the specified protocol sets its source IP address.

Examples

On the 6400 Switch Series, interface identification differs.

Defining a multicast IPv6 helper address of **2001:DB8::1** on port **1/1/2**:

```
switch(config-if)# ipv6 helper-address multicast 2001:DB8:0:0:0:0:0:1 egress 1/1/2
```

Removing the IP helper address of **2001:DB8::1** on port **1/1/2**:

```
switch(config-if)# no ipv6 helper-address multicast 2001:DB8:0:0:0:0:0:1 egress
1/1/2
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show dhcpv6-relay

`show dhcpv6-relay [vsx-peer]`

Description

Shows DHCP relay configuration settings.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show dhcpv6-relay
  DHCPv6 Relay Agent : enabled
  Option 79          : disabled
  L2vpn-clients      : enabled
  Source-interface   : enabled
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 helper-address

```
show ipv6 helper-address [interface <INTERFACE-ID>] [vsx-peer]
```

Description

Shows the helper IP addresses defined for all interfaces or a specific interface.

Parameter	Description
`interface <INTERFACE-ID>`	Specifies an interface. Format: **member/slot/port**.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# show ipv6 helper-address

 Interface: 1/1/1
 IPv6 Helper Address                             Egress Port
 ---------------------------------------------- -----------
 2001:db8:0:1::                                  -
 FF01::1:1000                                    1/1/2

 Interface: 1/1/2
 IPv6 Helper Address                             Egress Port
 --------------------------------------------   -----------
 2001:db8:0:1::                                  -

switch# show ipv6 helper-address interface 1/1/1

 Interface: 1/1/1
 IPv6 Helper Address                             Egress Port
 ---------------------------------------------- -----------
 2001:db8:0:1::                                  -
 FF01::1:1000                                    1/1/2
```

```
switch# show ipv6 helper-address interface vlan20
Interface: vlan20
 IP Helper Address                                Egress Port
 ----------------------------------------------  -----------
  2001::1                                          -
 ff01::1:1000                                     vlan30      default
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 31
DHCP server IPv4 commands

authoritative

```
authoritative
no authoritative
```

Description

Configures the DHCPv4 server as *authoritative* on the current VRF. This means that the server is the sole authority for the network on the VRF. Therefore, if a client requests an IP address lease for which the server has no record, the server responds with DHCPNAK, indicating that the client must no longer use that IP address. If the server is not authoritative, then it will ignore DHCPv4 requests received for unknown leases from unknown hosts.

The **no** form of this command disables authoritative mode on the current VRF.

Example

Configures DHCPv4 server authoritative mode on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# authoritative
```

Removes the DHCPv4 server authoritative mode on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# no authoritative
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server`	Administrators or local user group members with execution rights for this command.

bootp

```
bootp <REMOTE-URL>
no bootp <REMOTE-URL>
```

Description

Sets the BOOTP options that are returned by the DHCPv4 server for the current pool. BOOTP provides a way to distribute an IP address and boot image file to client stations. The DHCPv4 server returns the IP address and the location of the boot image file, which must be stored on an external TFTP server.

The **no** form of this command disables support for BOOTP.

Parameter	Description
<REMOTE-URL>	Specifies the name and location of a BOOTP file on a TFTP server in the format: `tftp://{<IP> | <HOST>}/<FILE>` ▪ *<IP>*: Specifies the IP address of the TFTP server hosting the file in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address `192.169.005.100` becomes `192.168.5.100`. ▪ *<HOST>*: Specifies the fully-qualified domain name of the TFTP server hosting the file. Range: 1 to 64 printable ASCII characters. ▪ *<FILE>*: Specifies the name of the BOOTP file. Range: 1 to 64 printable ASCII characters.

Example

Defines BOOTP support on the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# bootp tftp://10.0.0.1/mybootfile
```

Deletes BOOTP support on the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no bootp tftp://10.0.0.1/mybootfile
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

clear dhcp-server leases

`clear dhcp-server leases [all-vrfs | <IPV4-ADDR> vrf <VRF-NAME>] | vrf <VRF-NAME>]`

Description

Clears DHCPv4 server lease information. The DHCPv4 server must be disabled before clearing lease information.

Parameter	Description
`all-vrfs`	Clears leases for all VRFs.
`<IPV4-ADDR> vrf <VRF-NAME>`	Clears the lease for a specific client on a specific VRF. Specify the client address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address `192.169.005.100` becomes `192.168.5.100`.
`vrf <VRF-NAME>`	Clears leases for a specific VRF.

Examples

Clearing all DHCPv4 server leases.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# disable
switch(config-dhcp-server)# exit
switch(config)# exit
switch# clear dhcp-server leases
```

Clearing all DHCPv4 server leases for VRF **primary-vrf**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# disable
switch(config-dhcp-server)# exit
switch(config)# exit
switch# clear dhcp-server leases vrf primary-vrf
```

Clear the DHCPv4 server lease for IP address **10.10.10.1** on VRF **primary-vrf**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# disable
switch(config-dhcp-server)# exit
switch(config)# exit
switch# clear dhcp-server leases 10.10.10.1 vrf primary-vrf
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

default-router

```
default-router <IPV4-ADDR-LIST>
no default-router <IPV4-ADDR-LIST>
```

Description

Defines up to four default routers for the current DHCPv4 server pool.

The **no** form of this command removes the specified default routers from the pool.

Parameter	Description
<IPV4-ADDR-LIST>	Specifies the IP addresses of the default routers in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address `192.169.005.100` becomes `192.168.5.100`. Separate addresses with a space. A maximum of four IP addresses can be defined.

Example

Defines two default routers, **10.0.0.1** and **10.0.0.10**, for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# default-router ip 10.0.0.1 10.0.0.10
```

Deletes the default router **10.0.0.1** from the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no default-router ip 10.0.0.1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

dhcp-server external-storage

```
dhcp-server external-storage <VOLUME-NAME> file <LEASE-FILENAME> [delay <DELAY>]
no dhcp-server external-storage <VOLUME-NAME> file <LEASE-FILENAME> [delay <DELAY>]
```

Description

Configures the external storage file location for DHCPv4 server lease information. This file provides persistent storage, enabling DHCPv4 server settings to be restored when the switch is restarted. Lease information is stored in a flat file on the configured external device.

If external storage is not configured, then after a failure or reboot, all existing lease information is lost.

Lease information is saved to external storage each time the delay timer expires, which by default is every 300 seconds.

Lease information is not restored when issuing the command `dhcp-server enable`.

The **no** form of this command removes external storage support for the DHCPv4 server.

Parameter	Description
<VOLUME-NAME>	Specifies the external storage volume name. Range: 1 to 64 printable ASCII characters.
`file` *<LEASE-FILENAME>*	Specifies the external storage filename. Range: 1 to 255 printable ASCII characters.
`delay` *<DELAY>*	Specifies the interval in seconds between updates to the external storage file. Range: 15 to 86400. Default: 300.

Example

Stores the lease file on external storage volume **Storage1** in file **LeaseFile** at an interval of 600 seconds.

```
switch(config)# dhcp-server external-storage Storage1 file LeaseFile delay 600
```

Disables storage of the lease file on external storage volume **Storage1** in file **LeaseFile**.

```
switch(config)# no dhcp-server external-storage Storage1 file LeaseFile delay 600
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-server vrf

```
dhcp-server vrf <VRF-NAME>
no dhcp-server vrf <VRF-NAME>
```

Description

Configures the DHCPv4 server to support a VRF and changes to the `config-dhcp-server` context for that VRF.

The **no** form of this command removes DHCPv4 server support on a VRF.

Parameter	Description
<VRF-NAME>	Name of a VRF.

Example

Configures DHCPv4 server support on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
```

Removes DHCPv4 server support on VRF **primary**.

```
switch(config)# no dhcp-server vrf primary
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables the DHCPv4 server on the current VRF. The DHCPv4 server is disabled by default when configured on a VRF.

Example

Disables the DHCPv4 server on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# disable
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server`	Administrators or local user group members with execution rights for this command.

dns-server

```
dns-server <IPV4-ADDR-LIST>
no dns-server <IPV4-ADDR-LIST>
```

Description

Defines up to four DNS servers for the current DHCPv4 server pool.

The **no** form of this command removes the specified DNS servers from the pool.

Parameter	Description
<IPV4-ADDR-LIST>	Specifies the IP addresses of the DNS servers in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.Separate addresses with a space.

Example

Defines DNS servers for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# dns-server 10.0.20.1
```

Deletes a DNS server from the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no dns-server 10.0.20.1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

domain-name

```
domain-name  <DOMAIN-NAME>
no domain-name  <DOMAIN-NAME>
```

Description

Defines a domain name for the current DHCPv4 server pool.

The **no** form of this command removes the specified domain name from the pool.

Parameter	Description
<DOMAIN-NAME>	Specifies a domain name. Range: 1 to 255 printable ASCII characters.

Example

Defines a domain name for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# domain-name example.org.in
```

Deletes a domain name from the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no domain-name example.org.in
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables the DHCPv4 server on the current VRF. The DHCPv4 server is disabled by default when configured on a VRF.

Example

Enables the DHCPv4 server on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# enable
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server`	Administrators or local user group members with execution rights for this command.

lease

```
lease {<TIME> | infinite}
no lease
```

Description

Sets the length of the DHCPv4 lease time for the current pool. The lease time determines how long an IP address is valid before a DHCPv4 client must request that it be renewed.

The **no** form of this command returns the DHCPv4 lease time to its default value 1 hour.

Parameter	Description
<TIME>	Sets the DHCPv4 lease time. Format: DD:HH:MM. Default: 01:00:00.
`infinite`	Sets the DHCPv4 lease time to infinite. This means that addresses do not need to be renewed.

Example

Sets the lease time for DHCPv4 server pool **primary-pool** on VRF **primary** to **12** hours.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# lease 00:12:00
```

Deletes the lease time for DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no lease 00:12:00
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

netbios-name-server

```
netbios-name-server <IPV4-ADDR-LIST>
no netbios-name-server <IPV4-ADDR-LIST>
```

Description

Defines up to four NetBIOS WINS servers for the current DHCPv4 server pool. WINS is used by Microsoft DHCP clients to match host names with IP addresses.

The **no** form of this command removes the specified WINS servers from the pool.

Parameter	Description
<IPV4-ADDR-LIST>	Specifies the IP addresses of NetBIOS (WINS) servers in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. Separate addresses with a space. A maximum of four IP addresses can be defined.

Example

Defines two WINS servers for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# netbios-name-server ip 10.0.20.1 10.0.30.10
```

Deletes a WINS server from the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no netbios-name-server ip 10.0.20.1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

netbios-node-type

```
netbios-node-type <TYPE>
no netbios-node-type <TYPE>
```

Description

Defines the NetBIOS node type for the current DHCPv4 server pool.

The **no** form of this command removes the NetBIOS node type for the current pool.

Parameter	Description
<TYPE>	Specifies the NetBIOS node type: `broadcast`, `hybrid`, `mixed`, or `peer-to-peer`.

Examples

Defines the NetBIOS node type **broadcast** for the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# netbios-node-type broadcast
```

Deletes the NetBIOS node type **broadcast** from the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no netbios-node-type broadcast
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

option

```
option <OPTION-NUM> {ascii "<ASCII-STR>" | hex <HEX-STR> | ip <IPV4-ADDR-LIST>}
no option <OPTION-NUM> {ascii <ASCII-STR> | hex <HEX-STR> | ip <IPV4-ADDR-LIST>}
```

Description

Defines custom DHCPv4 options for the current DHCPv4 server pool. DHCPv4 options enable the DHCPv4 server to provide additional information about the network when DHCPv4 clients request an address.

The **no** form of this command removes custom DHCPv4 options from the pool.

Parameter	Description
<OPTION-NUM>	Specifies a DHCPv4 option number. For a list of DHCPv4 option numbers, see https://www.iana.org/assignments/bootp-dhcp-parameters/bootp-dhcp-parameters.xhtml. Range: 2 to 254.
ascii *<ASCII-STR>*	Specifies a value for the selected option as an ASCII string. Range: 1 to 255 ASCII characters. **NOTE:** If you specify **18** as the **<OPTION-NUM>** parameter, the ASCII string must be enclosed within quotation marks (").
hex *<HEX-STR>*	Specifies a value for the selected option as a hexadecimal string. Range: 1 to 255 hexadecimal characters.
ip *<IPV4-ADDR-LIST>*	Specifies a list of IP addresses in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. Separate addresses with a space. A maximum of four IP addresses can be defined.

Example

Defines DHCPv4 option **3** for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# option 3 ip 192.168.1.1
```

Deletes DHCPv4 option **3** for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no option 3 ip 192.168.1.1
```

Defines DHCPv4 option 18 for the server pool **mgmt-test** on VRF **mgmt**.

```
switch(config)# dhcp-server vrf mgmt
switch(config-dhcp-server)# pool mgmt-test
switch(config-dhcp-server-pool)# option 18 ascii "aswed"
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

pool

```
pool <POOL-NAME>
no pool <POOL-NAME>
```

Description

Creates a DHCPv4 server pool for the current VRF and switches to the `config-dhcp-server-pool` context for it. Multiple pools, each with a distinct range, can be assigned to a VRF. A maximum of 64 pools (IPv4 and IPv6), 64 address ranges, and 8182 clients are supported on the switch across all VRFs.

The **no** form of this command deletes the specified DHCPv4 server pool.

Parameter	Description
<POOL-NAME>	Specifies the DHCPv4 pool name. A maximum of 64 pools (IPv4 and IPv6) are supported across VRFs on the switch. Range: 1 to 32 printable ASCII characters. First character must be a letter or number.

Example

Creates the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)#
```

Deletes the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# no pool primary-pool
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server`	Administrators or local user group members with execution rights for this command.

range

```
range <LOW-IPV4-ADDR> <HIGH-IPV4-ADDR> [prefix-len <MASK>]
no range <LOW-IPV4-ADDR> <HIGH-IPV4-ADDR> [prefix-len <MASK>]
```

Description

Defines the range of IP addresses supported by the current DHCPv4 server pool. A maximum of 64 ranges are supported per switch across all VRFs.

The **no** form of this command deletes the address range for the current pool.

Parameter	Description
<LOW-IPV4-ADDR>	Specifies the lowest IP address in the pool in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<HIGH-IPV4-ADDR>	Specifies the highest IP address in the pool in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

`prefix-len` *<MASK>*	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32.
	NOTE: When active gateway is configured on the interface serviced by the pool, you must specify a prefix length that matches the mask on the IP address assigned to the interface. Otherwise, client stations will get a prefix length from active gateway that may not be consistent with the configured range, and a DHCP error will occur. In the following example, the DHCP range prefix is set to 16 to match the mask on the IP address assigned to interface VLAN 2.
	`switch(config)# interface vlan 2`
	`switch(config-if-vlan)# ip address 200.1.1.1/16`
	`switch(config-if-vlan)# active-gateway ip 200.1.1.3 mac 00:aa:aa:aa:aa:aa`
	`switch(config-if-vlan)# exit`
	`switch(config)# dhcp-server vrf primary`
	`switch(config-dhcp-server)# pool primary-pool`
	`switch(config-dhcp-server-pool)# range 192.168.1.1 192.168.1.100 prefix-len 16`

Examples

Defines the address range **192.168.1.1** to **192.168.1.100** with a mask of **24** bits for the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# 192.168.1.1 192.168.1.100 prefix-len 24
```

Deletes the address range **192.168.1.1** to **192.168.1.100** with a mask of **24** bits from the DHCPv4 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no 192.168.1.1 192.168.1.100 prefix-len 24
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcp-server-pool`	Administrators or local user group members with execution rights for this command.

show dhcp-server

```
show dhcp-server [all-vrfs]
show dhcp-server leases {all-vrfs | vrf <VRF-NAME>}
show dhcp-server pool <POOL-NAME> [vrf <VRF-NAME>]
```

Description

Shows configuration settings for the DHCPv4 server.

Parameter	Description
`all-vrfs`	Shows DHCPv4 server configuration settings for all VRFs.
`leases {all-vrfs | vrf <VRF-NAME>}`	Shows DHCPv4 server lease provided by the server for all VRFs or a specific VRF.
`pool <POOL-NAME> [vrf <VRF-NAME>]`	Shows DHCPv4 server pool configuration settings for all VRFs or a specific VRF.

Examples

Showing all DHCPv4 server configuration settings.

```
switch# show dhcp-server

VRF Name           : default
DHCP Server        : enabled
Operational State  : operational
Authoritative Mode : false
Config_status      : Applied

Pool Name          : test
Lease Duration     : 00:01:00


DHCP dynamic IP allocation
--------------------------
Start-IP-Address   End-IP-Address   Prefix-Length
----------------   --------------   --------------
192.168.1.1        192.168.1.20     24


DHCP Server options
-------------------
Option-Number   Option-Type    Option-Value
-------------   -----------    ------------
6               ip             10.0.0.3 10.0.0.4 10.0.0.5 10.0.0.6


DHCP Server static IP allocation
--------------------------------
IP-Address     Client-Hostname      State            MAC-Address
-----------    ----------------     ------           ------------
10.0.0.3       *                    OPERATIONAL      aa:aa:aa:aa:aa:aa


BOOTP Options
---------------
Boot-File-Name    TFTP-Server-Name    TFTP-Server-Address
--------------    ----------------    ---------------------
boot.txt          *                   10.0.0.10
```

Showing DHCP server configuration settings for VRF **primary-vrf**.

```
switch# show dhcp-server vrf primary-vrf

VRF Name           : primary-vrf
DHCP Server        : disabled
Operational State  : disabled
Authoritative Mode : false
Config_status      : Applied

Pool Name          : test
Lease Duration     : 00:01:00

DHCP dynamic IP allocation
--------------------------
Start-IP-Address   End-IP-Address   Prefix-Length
----------------   --------------   --------------
10.0.0.1           10.0.0.30        *
192.168.1.1        192.168.1.20     24
192.168.10.30      192.168.10.60    16
```

```
DHCP Server options
-------------------
Option-Number   Option-Type    Option-Value
-------------   -----------    ------------
6               ip             10.0.0.3 10.0.0.4 10.0.0.5 10.0.0.6
18              ascii          aswed


DHCP Server static IP allocation
--------------------------------
IP-Address    Client-Hostname   MAC-Address
----------    ---------------   -----------------
10.0.0.1        *               aa:bb:cc:11:12:a4
20.0.0.1        *               11:22:11:22:aa:dd


BOOTP Options
---------------
Boot-File-Name    TFTP-Server-Name     State            TFTP-Server-Address
--------------    ----------------     ------           ---------------------
boot.txt            *                  OPERATIONAL      10.0.0.10
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

static-bind

```
static-bind {ip <IPV4-ADDR>}|{ mac <MAC-ADDR>} [hostname <HOST>]
no static-bind <IPV4-ADDR-LIST>
```

Description

Creates a static binding that associates an IP address in the current pool with a specific MAC address. This causes the DHCPv4 server to only assign the specified IP address to a client station with the specified MAC address.

The **no** form of this command removes the specified binding.

Parameter	Description
<IPV4-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. The IP address must be within the address range defined for the current pool.
mac *<MAC-ADDR>*	Specifies a client station MAC address (xx:xx:xx:xx:xx:xx), where **x** is a hexadecimal number from 0 to F.
hostname *<HOST>*	Specifies the host name of the client station. Range: 1 to 255 printable ASCII characters

Examples

Defines a static address for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# static-bind ip 10.0.0.1 mac 24:be:05:24:75:73
```

Deletes a static address from the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcp-server vrf primary
switch(config-dhcp-server)# pool primary-pool
switch(config-dhcp-server-pool)# no static-bind ip 10.0.0.1 mac 24:be:05:24:75:73
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-dhcp-server-pool	Administrators or local user group members with execution rights for this command.

Chapter 32

DHCP server IPv6 commands

authoritative

```
authoritative
no authoritative
```

Description

Configures the DHCPv6 server as *authoritative* on the current VRF. This means that the server is the sole authority for the network on the VRF. It responds to client solicit messages with advertise messages having a priority/preference value set to 255 (the maximum), instead of 0 (the minimum). Clients always choose the DHCPv6 server with the highest priority/preference value. If two DHCPv6 servers send an advertise message with the same priority/preference value, then the client picks one and discards the other.

The **no** form of this command disables authoritative mode on the current VRF.

Example

Configures DHCPv6 server authoritative mode on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# authoritative
```

Removes DHCPv6 server authoritative mode on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# no authoritative
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server`	Administrators or local user group members with execution rights for this command.

clear dhcpv6-server leases

```
clear dhcpv6-server leases [all-vrfs | <IPV6-ADDR> vrf <VRF-NAME>] | vrf <VRF-NAME>]
```

Description

Clears DHCPv6 server lease information. The DHCPv6 server must be disabled before clearing lease information.

Parameter	Description
`all-vrfs`	Clears leases for all VRFs.
`<IPV6-ADDR> vrf <VRF-NAME>`	Clears the lease for a specific client on a specific VRF. Specify the client address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. You can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a hextet of four zeros to a single 0. For example, this address `2222:0000:3333:0000:0000:0000:4444:0055` becomes `2222:0:3333::4444:55`.
`vrf <VRF-NAME>`	Clears leases for a specific VRF.

Examples

Clearing all DHCPv6 server leases.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# disable
switch(config-dhcpv6-server)# exit
switch(config)# exit
switch# clear dhcpv6-server leases
```

Clearing all DHCPv6 server leases for VRF **primary-vrf**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# disable
switch(config-dhcpv6-server)# exit
switch(config)# exit
switch# clear dhcpv6-server leases vrf primary-vrf
```

Clear the DHCPv6 server lease for IP address **2001::1** on VRF **primary-vrf**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# disable
switch(config-dhcpv6-server)# exit
switch(config)# exit
switch# clear dhcpv6-server leases 2001::1 vrf primary-vrf
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

dhcpv6-server external-storage

```
dhcpv6-server external-storage <VOLUME-NAME> file <LEASE-FILENAME> [delay <DELAY>]
no dhcpv6-server external-storage <VOLUME-NAME> file <LEASE-FILENAME> [delay <DELAY>]
```

Description

Configures the external storage file location for DHCPv6 server lease information. This file provides persistent storage, enabling DHCPv6 server settings to be restored when the switch is restarted. Lease information is stored in a flat file on the configured external device.

If external storage is not configured, then after a failure or reboot, all existing lease information is lost.

Lease information is saved to external storage each time the delay timer expires, which by default is every 300 seconds.

Lease information is not restored when issuing the command **dhcp-server enable**.

The **no** form of this command removes external storage support for the DHCPv6 server.

Parameter	Description
<VOLUME-NAME>	Specifies the external storage volume name. Range: 1 to 64 printable ASCII characters.
`file` *<LEASE-FILENAME>*	Specifies the external storage filename. Range: 1 to 255 printable ASCII characters.
`delay` *<DELAY>*	Specifies the interval in seconds between updates to the external storage file. Range: 15 to 86400. Default: 300.

Example

Stores the lease file on external storage volume **Storage1** in file **LeaseFile** at an interval of 600 seconds.

```
switch(config)# dhcpv6-server external-storage Storage1 file LeaseFile delay 600
```

Disables storage of the lease file on external storage volume **Storage1** in file **LeaseFile**.

```
switch(config)# no dhcpv6-server external-storage Storage1 file LeaseFile delay
600
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcpv6-server vrf

```
dhcpv6-server vrf VRF-NAME
no dhcpv6-server vrf VRF-NAME
```

Description

Configures the DHCPv6 server to support a VRF and changes to the **config-dhcpv6-server** context for that VRF.

The **no** form of this command removes DHCPv6 server support on a VRF.

Parameter	Description
VRF-NAME	Name of a VRF.

Example

Configures DHCPv6 server support on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
```

Removes the DHCPv6 server support on VRF **primary**.

```
switch(config)# no dhcpv6-server vrf primary
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

disable

```
disable
```

Description

Disables the DHCPv6 server on the current VRF. The DHCPv6 server is disabled by default when configured on a VRF.

Example

Disables the DHCPv6 server on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# disable
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server`	Administrators or local user group members with execution rights for this command.

dns-server

```
dns-server <IPVv6-ADDR-LIST>
no dns-server <IPVv6-ADDR-LIST>
```

Description

Defines up to four DNS servers for the current DHCPv6 server pool.

The **no** form of this command removes the specified DNS servers from the pool.

Parameter	Description
<IPVv6-ADDR-LIST>	Specifies the IP addresses of the DNS servers in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. Separate addresses with a space. A maximum of four IP addresses can be defined.

Example

Defines DNS server **2001::13** for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# dns-server 2001::13
```

Deletes DNS server **2001::13** from the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# no dns-server 2001::13
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server-pool`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables the DHCPv6 server on the current VRF. The DHCPv6 server is disabled by default when configured on a VRF.

Example

Enables the DHCPv6 server on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# enable
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server`	Administrators or local user group members with execution rights for this command.

lease

```
lease {<TIME> | infinite}
no lease
```

Description

Sets the length of the DHCPv6 lease time for the current pool. The lease time determines how long an IP address is valid before a DHCPv6 client must request that it be renewed.

The **no** form of this command returns the DHCPv6 lease time to the default value 1 hour.

Parameter	Description
<TIME>	Sets the DHCPv6 lease time. Format: DD:HH:MM. Default: 01:00:00.
`infinite`	Sets the DHCPv6 lease time to infinite. This means that addresses do not need to be renewed.

Example

Sets the lease time for DHCPv6 server pool **primary-pool** on VRF **primary** to **12** hours.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# lease 00:12:00
```

Sets the lease time for DHCP server pool **primary-pool** on VRF **primary** to the default value.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# no lease 00:12:00
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server-pool`	Administrators or local user group members with execution rights for this command.

option

```
option <OPTION-NUM> {ascii <ASCII-STR> | hex <HEX-STR> | ip <IPV6-ADDR-LIST>}
no option <OPTION-NUM> {ascii <ASCII-STR> | hex <HEX-STR> | ip <IPV6-ADDR-LIST>}
```

Description

Defines custom DHCPv6 options for the current DHCPv6 server pool.

The **no** form of this command removes custom DHCPv6 options from the pool.

Parameter	Description
<OPTION-NUM>	Specifies a DHCPv6 option number. Range: 2 to 254.
ascii *<ASCII-STR>*	Specifies a value for the selected option as an ASCII string. Range: 1 to 255 ASCII characters.
hex *<HEX-STR>*	Specifies a value for the selected option as a hexadecimal string. Range: 1 to 255 hexadecimal characters.
ip *<IPV6-ADDR-LIST>*	Specifies a list of IP addresses for the option in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.

Example

Defines DHCPv6 option **22** for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# option 22 ipv6 2001::12
```

Deletes DHCPv6 option 22 for the server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# no option 22 ipv6 2001::12
```

Defines DHCPv6 option **18** for the server pool **mgmt-test** on VRF **mgmt**.

```
switch(config)# dhcpvv6-server vrf mgmt
switch(config-dhcpv6-server)# pool mgmt-test
switch(config-dhcpv6-server-pool)# option 18 ascii "aswed"
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server-pool`	Administrators or local user group members with execution rights for this command.

pool

```
pool <POOL-NAME>
no pool <POOL-NAME>
```

Description

Creates a DHCPv6 server pool for the current VRF and switches to the `config-dhcpv6-server-pool` context for it. Multiple pools, each with a distinct range, can be assigned to a VRF. A maximum of 64 pools (IPv4 and IPv6), 64 address ranges, and 8182 clients are supported on the switch across all VRFs.

The **no** form of this command deletes the specified DHCPv6 server pool.

Parameter	Description
<POOL-NAME>	Specifies the DHCPv6 pool name. A maximum of 64 pools (IPv4 and IPv6) are supported across VRFs on the switch. Range: 1 to 32 printable ASCII characters. First character must be a letter or number.

Example

Creates the DHCPv6 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)#
```

Deletes the DHCPv6 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# no pool primary-pool
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server`	Administrators or local user group members with execution rights for this command.

range

```
range <LOW-IPV6-ADDR> <HIGH-IPV6-ADDR> [prefix-len <MASK>]
no range <LOW-IPV6-ADDR> <HIGH-IPV6-ADDR> [prefix-len <MASK>]
```

Description

Defines the range of IP addresses supported by the current DHCPv6 server pool. A maximum of 64 ranges are supported per switch across all VRFs.

The **no** form of this command deletes the address range for the current pool.

Parameter	Description
<LOW-IPV6-ADDR>	Specifies the lowest IP address in the pool in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<HIGH-IPV6-ADDR>	Specifies the highest IP address in the pool in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
prefix-len *<MASK>*	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 64 to128.

Example

Defines an address range for the DHCPv6 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# range 2001::1 2001::10 prefix-len 64
```

Deletes an address range for the DHCPv6 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# no range 2001::1 2001::10 prefix-len 64
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server-pool`	Administrators or local user group members with execution rights for this command.

show dhcpv6-server

```
show dhcpv6-server [all-vrfs]
show dhcpv6-server leases {all-vrfs | vrf <VRF-NAME>}
show dhcpv6-server pool <POOL-NAME> [vrf <VRF-NAME>]
```

Description

Shows configuration settings for the DHCPv6 server.

Parameter	Description
`all-vrfs`	Shows DHCPv6 server configuration settings for all VRFs.
`leases {all-vrfs | vrf <VRF-NAME>}`	Shows DHCPv6 server lease provided by the server for all VRFs or a specific VRF.
`pool <POOL-NAME> [vrf <VRF-NAME>]`	Shows DHCPv6 server pool configuration settings for all VRFs or a specific VRF.

Examples

Showing all DHCPv6 server configuration settings.

```
switch# show dhcpv6-server

VRF Name           : default
DHCPv6 Server      : enabled
Operational State  : operational
Authoritative Mode : true
Config_status      : Applied

Pool Name          : test
Lease Duration     : 00:01:00

DHCPV6 dynamic IP allocation
-----------------------------
Start-IPv6-Address  End-IPv6-Address   Prefix-Length
------------------  ----------------   -------------
2001::2             2001::10           64

DHCPv6 Server options
---------------------
Option-Number     Option-Type    Option-Value
-------------     -----------    ------------
7                 ipv6           2001::15

DHCPv6 Server static IP allocation
-----------------------------------
DHCPv6 Server static host is not configured.
```

Showing DHCPv6 server configuration settings for VRF **primary-vrf**.

```
switch# show dhcpv6-server vrf primary-vrf

VRF Name           : primary-vrf
DHCPv6 Server      : disabled
Operational State  : standby
Authoritative Mode : false
Config_status      : Applied

Pool Name          : test
Lease Duration     : 00:01:00

DHCPV6 dynamic IP allocation
-----------------------------
Start-IPv6-Address  End-IPv6-Address   Prefix-Length
------------------  ----------------   -------------
2000::1             2000::20           *
2001::20            2001::50           *
2001::2             2001::10           64
2010::20            2010::40           *


DHCPv6 Server options
---------------------
Option-Number     Option-Type    Option-Value
-------------     -----------    ------------
7                 ipv6           2001::15
23                ipv6           2001::30
30                ipv6           2001::10


DHCPv6 Server static IP allocation
-----------------------------------
```

```
DHCPv6 Server static host is not configured.

Pool Name       : v6test
Lease Duration  : 00:01:00

DHCPv6 dynamic IP allocation
-----------------------------
Start-IPv6-Address    End-IPv6-Address    Prefix-Length
------------------    ----------------    -------------
2001::1               2001::20            64
2010::10              2010::30            *
2020::20              2020::60            *


DHCPv6 Server options
---------------------
Option-Number    Option-Type    Option-Value
-------------    -----------    -----------------
7                ipv6           2001::20
23               ipv6           2001:0db8:85a3:0000:0000:8a2e:0370:7334
2001:0db8:85a3:0000:0000:8a2e:0370:7335
                                2001:0db8:85a3:0000:0000:8a2e:0370:7336
2001:0db8:85a3:0000:0000:8a2e:0370:7337


DHCPv6 Server static IP allocation
------------------------------------
IPv6-Address    Client-Hostname     State         Client-Id
------------    ---------------     -----------   ---------
2100::4         *                   OPERATIONAL   1:0:a0:24:ab:fb:9c
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

static-bind

```
static-bind ipv6 <IPVv6-ADDR> client-id <ID> [hostname <HOST>]
no static-bind ipv6 <IPVv6-ADDR-LIST>
```

Description

Creates a static binding that associates an IP address in the current pool with a client identifier or DUID. This causes the DHCPv6 server to only assign the specified IP address to a client station with the specified client identifier or DUID.

The **no** form of this command removes the specified static binding from the pool.

Parameter	Description
<IPV6-ADDR>	Specifies the IP address to assign in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. For example, this address `2222:0000:3333:0000:0000:0000:4444:0055` becomes `2222:0:3333::4444:55`.
`client-id` *<ID>*	Specifies the client identifier or DUID.
`hostname` *<HOST>*	Specifies the host name of the client station. Range: 1 to 255 printable ASCII characters

Example

Defines a static address for the DHCPv6 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# static-bind ipv6 2001::10 client-id
1:0:a0:24:ab:fb:9c
```

Deletes a static address from the DHCPv6 server pool **primary-pool** on VRF **primary**.

```
switch(config)# dhcpv6-server vrf primary
switch(config-dhcpv6-server)# pool primary-pool
switch(config-dhcpv6-server-pool)# no static-bind ipv6 2001::10 client-id
1:0:a0:24:ab:fb:9c
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-server-pool`	Administrators or local user group members with execution rights for this command.

Chapter 33

DHCP snooping commands

clear dhcp-snooping binding

`clear dhcp-snooping binding {all | ip <IP-ADDR> vlan <VLAN-ID> | port <PORT-NUM> | vlan <VLAN-ID>}`

Description

Clears DHCP snooping binding entries.

Parameter	Description
`all`	Specifies that all DHCP binding information is to be cleared.
`ip <IP-ADDR> vlan <VLAN-ID>`	Specifies the IP address and VLAN for which all DHCP binding information is to be cleared.
`port <PORT-NUM>`	Specifies the port number for which all DHCP binding information is to be cleared.
`vlan <VLAN-ID>`	Specifies the VLAN for which all DHCP binding information is to be cleared.

Examples

On the 6400 Switch Series, interface identification differs.

Clearing all DHCP binding information for IP address 192.168.2.4 and VLAN 5:

```
switch(config)# clear dhcp-snooping binding ip 192.168.2.4 vlan 5
```

Clearing all DHCP binding information for port 1/1/1:

```
switch(config)# clear dhcp-snooping binding port 1/1/1
```

Clearing all DHCP binding information for VLAN 10:

```
switch(config)# clear dhcp-snooping binding vlan 10
```

Clearing all DHCP binding information:

```
switch(config)# clear dhcp-snooping binding all
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**. The **ipv4** parameter is deprecated and replaced with **ip**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear dhcp-snooping statistics

```
clear dhcp-snooping statistics
```

Description

Clears all DHCP snooping statistics.

Examples

Clear all DHCP snooping statistics:

```
switch# clear dhcp-snooping statistics
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

dhcp-snooping

```
dhcp-snooping
no dhcp-snooping
```

Description

Enables DHCP snooping. DHCP snooping is disabled by default. DHCP snooping is not supported on the management interface.

The **no** form of the command disables DHCP snooping, flushing all the IP bindings learned since DHCP snooping was enabled.

Examples

Enabling DHCP snooping:

```
switch(config)# dhcp-snooping
```

Disabling DHCP snooping:

```
switch(config)# no dhcp-snooping
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping (in config-vlan context)

```
dhcp-snooping
no dhcp-snooping
```

Description

Enables DHCP snooping for the specified VLAN in the **config-vlan** context. DHCP snooping is disabled by default for all VLANs.

The no form of the command disables DHCP snooping on the specified VLAN, flushing all the IP bindings learned for this VLAN since DHCP snooping was enabled for this VLAN.

Examples

Enabling DHCP snooping on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# dhcp-snooping
switch(config-vlan-100)# exit
switch(config)#
```

Disabling DHCP snooping on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# no dhcp-snooping
switch(config-vlan-100)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan`	Administrators or local user group members with execution rights for this command.

dhcp-snooping allow-overwrite-binding

```
dhcp-snooping allow-overwrite-binding
no dhcp-snooping allow-overwrite-binding
```

Description

Allows binding to be overwritten for the same IP address. When enabled, and a DHCP server offers a host an IP address that is already bound to an existing host in the binding table, the existing binding is overwritten for the new host if the new host is successfully able to acquire the same IP address. This overwriting is disabled by default, causing the DHCP server offers to be dropped.

The **no** form of the command disables DHCP snooping overwrite binding.

Examples

Enabling DHCP snooping overwrite binding:

```
switch(config)# dhcp-snooping allow-overwrite-binding
```

Disabling DHCP snooping overwrite binding:

```
switch(config)# no dhcp-snooping allow-overwrite-binding
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping authorized-server

```
dhcp-snooping authorized-server <IP-ADDR> [vrf <VRF-NAME>]
no dhcp-snooping authorized-server <IP-ADDR> [vrf <VRF-NAME>]
```

Description

Adds an authorized (trusted) DHCP server to a list of authorized servers for use by DHCP snooping. This command can be issued multiple times, adding a maximum of 20 authorized servers per VRF. By default, with an empty list of authorized servers, all DHCP servers are considered to be trusted for DHCP snooping purposes.

The **mgmt** VRF cannot be used with this command.

The no form of this command deletes the specified DHCP server from the authorized list.

Parameter	Description
<IP-ADDR>	Specifies the IP address of the trusted DHCP server.
vrf *<VRF-NAME>*	Specifies the VRF name. The name can be **default** or a configured VRF instance but it cannot be **mgmt**.

Usage

For authorized server lookup, the VRF is derived from the Switch Virtual Interface (SVI) configured for the incoming VLAN. If the SVI is not configured, the `default` VRF is assumed.

Examples

Adding DHCP servers 192.168.2.2, 192.168.2.3, and 192.168.2.10 to the authorized server list:

```
switch(config)# dhcp-snooping authorized-server 192.168.2.2
switch(config)# dhcp-snooping authorized-server 192.168.2.3 vrf default
switch(config)# dhcp-snooping authorized-server 192.168.2.10 vrf default
```

Removing DHCP server 192.168.2.3 from the authorized server list:

```
switch(config)# no dhcp-snooping authorized-server 192.168.2.3 vrf default
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping event-log client

```
dhcp-snooping event-log client
no dhcp-snooping event-log client
```

Description

This command enables or disables dhcp-snooping client level event logs that help with client telemetry on a remote management station such as Aruba Central. By default, client level event logs are disabled. The **no** form of this command disables client-level event logs for DHCP snooping after they are enabled. View these logged DHCP snooping events by issuing the command **show events -c dhcp-snooping**.

For additional information on DHCP-related event logging, please refer to the Event Log Message Reference Guide.

Examples

Enabling DHCP client level event logs:

```
switch(config)# # dhcp-snooping event-log client
```

Disabling external storage:

```
witch(config)# # no dhcp-snooping event-log client
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping external-storage

```
dhcp-snooping external-storage volume <VOL-NAME> file <FILE-NAME>
no dhcp-snooping external-storage volume <VOL-NAME> file <FILE-NAME>
```

Description

Configures external storage to be used for backing up IP bindings (used by DHCP snooping) to a file. When configured, the switch stores all the IP bindings in an external storage file so that they are retained after the switch restarts. When the switch restarts, it reads the IP bindings from the configured external storage file to populate its local cache.

When both external storage and flash storage are configured to store DHCP snooping IP bindings, the external storage takes priority, and is used exclusively until it becomes unconfigured, at which time flash storage (if configured) is used. Later, if external storage is configured again, flash storage stops and external storage resumes.

The no form of this command disables the saving of IP bindings in an external storage file.

Parameter	Description
`volume <VOL-NAME>`	Specifies the name of the existing external storage volume where the IP bindings file will be saved. Before running the **dhcp-snooping external-storage volume** command, first create the external storage volume using command **external-storage <VOLUME-NAME>**. See *External storage commands* in the *Command-Line Interface Guide*.
`file <FILE-NAME>`	Specifies the file name to use for storing IP bindings. Maximum 255 characters.

Configuring IP bindings storage in file **dsnoop_ipbindings** on existing volume **dhcp_snoop**:

```
switch(config)# dhcp-snooping external-storage volume dhcp_snoop file dsnoop_
ipbindings
```

Disabling external storage:

```
switch(config)# no dhcp-snooping external-storage volume dhcp_snoop
```

Disabling external storage when flash storage is also configured (note the message indicating that flash storage will be used):

```
switch(config)# no dhcp-snooping external-storage volume dhcp_snoop
dhcp-snooping will use flash storage to store IP Binding database
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.08	Updated example with flash storage information.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping flash-storage

```
dhcp-snooping flash-storage [delay <DELAY>]
no dhcp-snooping flash-storage [delay <DELAY>]
```

Description

Configures switch flash storage to be used for backing up client IP bindings (used by DHCP snooping). When flash storage is configured (and external storage is not already configured for this purpose), the switch stores the IP bindings in switch flash storage. When the switch restarts, it reads the IP bindings from the switch flash storage to populate its local cache.

Writing the IP bindings to flash storage only occurs after the configured delay and if there has been a change in client IP bindings. Writing is skipped when client IP bindings have not changed since the previous write.

Omitting **delay <DELAY>** sets the default delay of 900 seconds.

To reduce switch flash aging it is recommended that you use external storage (command **dhcp-snooping external-storage**) to backup DHCP snooping IP bindings. Alternatively, consider configuring flash storage with a substantial delay between writes.

When both external storage and flash storage are configured to store DHCP snooping IP bindings, the external storage takes priority, and is used exclusively until it becomes unconfigured, at which time flash storage (if configured) is used. Later, if external storage is configured again, flash storage stops and external storage resumes.

The no form of this command disables the saving of IP bindings in flash storage.

Parameter	Description
`delay <DELAY>`	Specifies the delay in seconds between writes (when necessary) to the flash storage, Default: 900. Range: 300 to 86400.

Examples

Configuring switch flash storage for DHCP snooping IP binding storage with a write delay of 1200 seconds:

```
switch(config)# dhcp-snooping flash-storage delay 1200
Warning: Using flash storage reduces switch lifetime. It is recommended to use an
external-storage.
Do you want to continue  (y/n)? y
switch(config)#
```

Unconfiguring usage of switch flash storage for IP bindings :

```
switch(config)# no dhcp-snooping flash-storage
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping max-bindings

```
dhcp-snooping max-bindings <MAX-BINDINGS>
no dhcp-snooping max-bindings <MAX-BINDINGS>
```

Description

Sets the maximum number of DHCP bindings allowed on the selected interface. For all interfaces on which this command is not run, the default max binding is the maximum value of the range.

The no form of the command reverts max bindings for the selected interface to its default.

Parameter	Description
<MAX-BINDINGS>	Specifies the maximum number of DHCP bindings. Range 1 to 8192.

Examples

On the 6400 Switch Series, interface identification differs.

Set the DHCP max bindings to 256 on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# dhcp-snooping max-bindings 256
switch(config-if)# exit
switch(config)#
```

Revert DHCP max bindings to its default on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no dhcp-snooping max-bindings 256
switch(config-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

dhcp-snooping option 82

```
dhcp-snooping option 82 [remote-id {mac | subnet-ip | mgmt-ip}]
                          [untrusted-policy {drop | keep | replace}]
no dhcp-snooping option 82 [remote-id {mac | subnet-ip | mgmt-ip}]
                          [untrusted-policy {drop | keep | replace}]
```

Description

Configures the addition of option 82 DHCP relay information to DHCP client packets that are being forwarded on trusted ports. DHCP relay is enabled by default.

In the switch default state and when this command is entered without parameters (**dhcp-snooping option 82**), this default configuration is used:

```
dhcp-snooping option 82 remote-id mac untrusted-policy drop
```

When **remote-id** is omitted, its default (**mac**) is used. When **untrusted-policy** is omitted, its default (**drop**) is used.

The no form of this command disables DHCP snooping option 82.

Parameter	Description
`remote-id`	Specifies what address to use as the remote ID for the `replace` option of `untrusted-policy`. Specify one of these address types:

Parameter	Description
`mac`	The default. Uses the switch MAC address as the remote ID.
`subnet-ip`	Uses the IP address of the client VLAN as the remote ID.
`untrusted-policy`	Specifies what action to take for DHCP packets (with option 82) that are received on untrusted ports. Specify one of these actions:
`drop`	The default. Drop DHCP packets (with option 82) without forwarding them.
`keep`	Forward DHCP packets (with option 82).
`replace`	Replace the option 82 information in the DHCP packets with whatever is set for **remote-id** (one of: **mac**, **subnet-ip**, or **mgmt-ip**) and forward the packets.

Examples

Configuring DHCP snooping option 82 with the keep action:

```
switch(config)# dhcp-snooping option 82 untrusted-policy keep
```

Configuring DHCP snooping option 82 with `mgmt-ip` as the `remote-id` and the `replace` action:

```
switch(config)# dhcp-snooping option 82 remote-id mgmt-ip untrusted-policy replace
```

Disabling DHCP snooping option 82:

```
switch(config)# no dhcp-snooping option 82 untrusted-policy keep
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping static-attributes

```
dhcp-snooping static-attributes
no dhcp-snooping static-attributes
```

Description

Enables storage of static attributes provided to the DHCP client by DHCP server during DHCP packet exchange. Disabled by default. When enabled, the following attributes are stored in OVSDB along with the client IP binding entry:

1. Name server IP addresses: DNS server IPs provided by the DHCP server to the client. Maximum: 3 per client.
2. Default gateway IP address: Router IP addresses provided by DHCP server to the client. Maximum: 3 per client.
3. Server IP address: IP address of the DHCP server that leased the IP to the client.

The **no** form of the command disables storing of client static attributes. After disabling, existing client static attributes will be flushed.

Examples

Enabling the storage of DHCP snooping static attributes:

```
switch(config)# dhcp-snooping static-attributes
```

Disabling the storage of DHCP snooping static attributes:

```
switch(config)# no dhcp-snooping static-attributes
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping trust

```
dhcp-snooping trust
no dhcp-snooping trust
```

Description

Enables DHCP snooping trust on the selected port. Only server packets received on trusted ports are forwarded. All the ports are untrusted by default.

The **no** form of the command disables DHCP snooping trust on the selected port.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling DHCP snooping trust on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# dhcp-snooping trust
switch(config-if)# exit
switch(config)#
```

Disabling DHCP snooping trust on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# no dhcp-snooping trust
switch(config-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

dhcp-snooping tunnel vxlan trust

```
dhcp-snooping tunnel vxlan trust
no dhcp-snooping tunnel vxlan trust
```

Description

Enables dhcp-snooping trust on all VxLAN tunnels.

The no form of the command to marks all VxLAN tunnels as untrusted.

By default, all VxLAN tunnel interfaces are trusted. When trust is disabled on VxLAN tunnel interfaces:

- DHCP broadcast packets are not forwarded on VxLAN tunnels.
- DHCP server packets received on VxLAN tunnel interfaces are discarded.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling trust on all VxLAN tunnel interfaces:

```
switch(config)# dhcp-snooping tunnel vxlan trust
```

Disabling trust on all VxLAN tunnel interfaces:

```
switch(config)# no dhcp-snooping tunnel vxlan trust
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.11.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcp-snooping verify mac

```
dhcp-snooping verify mac
no dhcp-snooping verify mac
```

Description

This command enables verification of the hardware address field in DHCP client packets. When enabled, the DHCP client hardware address field and the source MAC address must be the same for packets received on untrusted ports or else the packet is dropped. This DHCP snooping MAC verification is enabled by default.

The **no** form of the command disables DHCP snooping MAC verification.

Examples

Enabling DHCP snooping MAC verification:

```
switch(config)# dhcp-snooping verify mac
```

Disabling DHCP snooping MAC verification:

```
switch(config)# no dhcp-snooping verify mac
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show dhcp-snooping

```
show dhcp-snooping [vsx-peer]
```

Description

Shows the DHCP snooping configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the DHCP snooping configuration:

```
switch# show dhcp-snooping

dhcp-snooping Information

dhcp-snooping                  : Yes             Verify MAC Address   : Yes
Allow Overwrite Binding        : No              Enabled VLANs        : 1-100
Static Attributes              : Yes
Client Event Logs              : Yes

Option 82 Configurations

Untrusted Policy               : replace          Insertion            : Yes
Option 82 Remote-id            : mac

External Storage Information

Volume Name    : ipbinding
File Name      : ipv4Bindings
Inactive Since : 01:23:20 09/10/2021
Error          : File Write Failure

Flash Storage Information

File Write Delay : 300 seconds
Active Storage   : External

Authorized Server Configurations

VRF                             Authorized Servers
------------                  ----------------------
default                        1.1.10.3
default                        10.10.10.1
default                        10.10.10.56
default                        200.10.10.3
green                          1.1.10.3
green                          1.10.10.3
green                          10.10.100.3
red                            192.168.122.53
red                            192.168.122.121

Port Information

                      Max         Static      Dynamic
Port        Trust     Bindings    Bindings    Bindings
--------    -----      --------   --------      --------
1/1/2       Yes        5000        50           0
1/1/3       Yes        8192        0            0
1/1/5       Yes        8192        0            22
1/1/16      No         100         0            0
```

```
10/10/10    No         8100        320           200
lag120      No         512         0             0
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.08	Updated example with flash storage information.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcp-snooping binding

```
show dhcp-snooping binding [vsx-peer][detail]
```

Description

Shows the DHCP snooping binding configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
`detail`	Shows detailed information for active IP bindings on the system.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the DHCP snooping binding configuration:

```
switch(config)# show dhcp-snooping binding

  MacAddress         IP                VLAN  Interface  Time-Left
  -----------------  ----------------  ----  ---------  ---------
  aa:b1:c1:dd:ee:ff  10.2.3.4          1     1/1/2      582
  aa:b2:c2:dd:ee:ff  10.2.3.5          1     1/1/2      584
```

Showing detailed information for active IP bindings:

```
switch(config)# show dhcp-snooping binding detail

VLAN Id : 2, MAC : 00:50:56:96:74:46

  IP               Interface  Time-Left
  ---------------  ---------  -------------------
  100.1.2.100      1/1/23     194

  Static Attributes:
  Default Router   : 100.1.2.1, 192.1.1.1, 1.1.1.2
  Server IP        : 10.1.84.2
  Name Servers     : 192.1.1.2, 2.2.2.2, 1.1.1.1



VLAN Id : 3, MAC : 00:50:56:96:e5:8e

  IP               Interface  Time-Left
  ---------------  ---------  -------------------
  100.1.3.100      2/1/22     145

  Static Attributes:
  Default Router   : 100.1.3.1, 192.1.1.1, 1.1.1.2
  Server IP        : 10.1.84.2
  Name Servers     : 192.1.1.2, 2.2.2.2, 1.1.1.1

VLAN Id : 3, MAC : 00:11:01:00:00:03

  IP               Interface  Time-Left
  ---------------  ---------  -------------------
  100.1.3.99       2/1/24     137

  Static Attributes:
  Default Router   : 100.1.3.1, 192.1.1.1, 1.1.1.2
  Server IP        : 10.1.84.2
  Name Servers     :192.168.0.1, 192.168.1.1, 192.168.2.1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.10	Detail parameter added.

Release	Modification
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcp-snooping statistics

```
show dhcp-snooping statistics [vsx-peer]
```

Description

Shows the DHCP snooping statistics.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing the DHCP snooping statistics:

```
switch(config)# show dhcp-snooping statistics

 Packet-Type  Action   Reason                         Count
 -----------  -------  -----------------------------  ---------
 server       forward  from trusted port              5425
 client       forward  to trusted port                3895
 server       drop     received on untrusted port     117
 server       drop     unauthorized server            214
 client       drop     destination on untrusted port  78
 client       drop     untrusted option 82 field      85
 client       drop     bad DHCP release request       0
 client       drop     failed verify MAC check        5
 client       drop     failed on max-binding limit    15
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **dhcpv4-snooping** keyword is deprecated and replaced with **dhcp-snooping**.
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 34

DHCPv6 snooping commands

clear dhcpv6-snooping binding

```
clear dhcpv6-snooping binding {all | ip <IPV6-ADDR> vlan <VLAN-ID> | interface <IFNAME> |
vlan <VLAN-ID>}
```

Description

Clears DHCPv6 snooping binding entries.

Parameter	Description
`all`	Specifies that all DHCPv6 binding information is to be cleared.
`ip <IPV6-ADDR> vlan <VLAN-ID>`	Specifies the IPv6 address and VLAN for which all DHCPv6 binding information is to be cleared.
`interface <IFNAME>`	Specifies the interface for which all DHCPv6 binding information is to be cleared.
`vlan <VLAN-ID>`	Specifies the VLAN for which all DHCPv6 binding information is to be cleared. Range: 1 to 4094.

Examples

On the 6400 Switch Series, interface identification differs.

Clearing all DHCPv6 binding information for 5000::1 vlan 1:

```
switch(config)# clear dhcpv6-snooping binding ip 5000::1 vlan 1
```

Clearing all DHCPv6 binding information for interface 1/1/10:

```
switch(config)# clear dhcpv6-snooping binding interface 1/1/10
```

Clearing all DHCPv6 binding information for VLAN 10:

```
switch(config)# clear dhcpv6-snooping binding vlan 10
```

Clearing all DHCPv6 binding information:

```
switch(config)# clear dhcpv6-snooping binding all
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear dhcpv6-snooping guard-policy statistics

```
clear dhcpv6-snooping guard-policy statistics [vlan <VLAN-ID> | interface <INTERFACE-NAME>]
```

Description

Clears all DHCPv6 snooping guard policy statistics from the specified VLAN or interface.

Parameter	Description
<VLAN-ID>	Specifies the VLAN ID. Range: 1-4094.
<INTERFACE-NAME>	Specifies the interface name.

Examples

Clearing all DHCPv6 snooping guard policy statistics from VLAN 100:

```
switch# clear dhcpv6-snooping guard-policy statistics vlan 100
```

Clearing all DHCPv6 snooping guard policy statistics from interface 1/1/10:

```
switch# clear dhcpv6-snooping guard-policy statistics interface 1/1/10
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear dhcpv6-snooping statistics

```
clear dhcpv6-snooping statistics
```

Description

Clears all DHCPv6 snooping statistics.

Examples

Clear all DHCPv6 snooping statistics:

```
switch# clear dhcpv6-snooping statistics
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

dhcpv6-snooping

```
dhcpv6-snooping
no dhcpv6-snooping
```

Description

Enables DHCPv6 snooping. DHCPv6 snooping is disabled by default. DHCPv6 snooping is not supported on the management interface.

The no form of the command disables DHCPv6 snooping, flushing all the IP bindings learned since DHCPv6 snooping was enabled.

Examples

Enabling DHCPv6 snooping:

```
switch(config)# dhcpv6-snooping
```

Disabling DHCPv6 snooping:

```
switch(config)# no dhcpv6-snooping
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping guard-policy

```
dhcpv6-snooping guard-policy <POLICY-NAME>
no dhcpv6-snooping guard-policy <POLICY-NAME>
```

Description

Configures a DHCPv6 snooping guard policy with the given name and enters the guard policy configuration context.

The no form of the command disables the specified guard policy.

Parameter	Description
<POLICY-NAME>	Specifies the name of the DHCPv6 snooping guard policy. Maximum length: 64.

Examples

Creating the DHCPv6 snooping guard policy name pol1:

```
switch(config)# dhcpv6-snooping guard-policy pol1
switch(config-guard-policy-pol1)#
```

Deleting the DHCPv6 snooping guard policy named pol1:

```
switch(config)# no dhcpv6-snooping guard-policy pol1
```

Creating the DHCPv6 snooping guard policy name pol1 on interface 1/1/1:

The DHCPv6 snooping guard policy applied on the port takes priority over the policy applied over VLAN.

```
switch(config)# interface 1/1/1
switch(config-if)# dhcpv6-snooping guard-policy pol1
```

Creating the DHCPv6 snooping guard policy name pol1 on a VLAN:

```
switch(config)# vlan 100
switch(config-vlan-100)# dhcpv6-snooping guard-policy pol1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-if`
	`config-dhcpv6-guard-policy`
	`config-vlan-<VLAN-ID>`
		Administrators or local user group members with execution rights for this command.

dhcpv6-snooping (in config-vlan context)

```
dhcpv6-snooping
no dhcpv6-snooping
```

Description

Enables DHCPv6 snooping in the `config-vlan` context. DHCPv6 snooping is disabled by default for all VLANs.

The no form of the command disables DHCPv6 snooping on the specified VLAN, flushing all the IPv6 bindings learned for this VLAN since DHCPv6 snooping was enabled for this VLAN.

Examples

Enabling DHCPv6 snooping on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# dhcpv6-snooping
switch(config-vlan-100)# exit
switch(config)#
```

Disabling DHCPv6 snooping on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# no dhcpv6-snooping
switch(config-vlan-100)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan`	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping authorized-server

```
dhcpv6-snooping authorized-server <IPV6-ADDR> [vrf <VRF-NAME>]
no dhcpv6-snooping authorized-server <IPV6-ADDR> [vrf <VRF-NAME>]
```

Description

Adds an authorized (trusted) DHCPv6 server to a list of authorized servers for use by DHCPv6 snooping. This command can be issued multiple times, adding a maximum of 20 authorized servers per VRF. By default, with an empty list of authorized servers, all DHCPv6 servers are considered to be trusted for DHCPv6 snooping purposes.

The `mgmt` VRF cannot be used with this command.

Configure the link local IPv6 address instead of global IPv6 address of the DHCPv6 server as the authorized-server. For example:

```
switch(config)# dhcpv6-snooping authorized-server fe80::2ca4:fa40:d4cd:bc2f
```

The no form of this command deletes the specified DHCPv6 server from the authorized list.

Parameter	Description
<IPV6-ADDR>	Specifies the IPv6 address of the trusted DHCPv6 server.
vrf *<VRF-NAME>*	Specifies the VRF name. The name can be `default` or a configured VRF instance but it cannot be `mgmt`.

Usage

For authorized server lookup, the VRF is derived from the Switch Virtual Interface (SVI) configured for the incoming VLAN. If the SVI is not configured, the `default` VRF is assumed.

Examples

Adding DHCP servers ABCD:5ACD::2000, and ABCD:5ACD::2010 to the authorized server list:

```
switch(config)# dhcpv6-snooping authorized-server ABCD:5ACD::2000 vrf default
switch(config)# dhcpv6-snooping authorized-server ABCD:5ACD::2010 vrf default
```

Removing DHCP server ABCD:5ACD::2000 from the authorized server list:

```
switch(config)# no dhcpv6-snooping authorized-server ABCD:5ACD::2000 vrf default
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping event-log client

```
dhcpv6-snooping event-log client
no dhcpv6-snooping event-log client
```

Description

This command enables or disables DHCPv6 snooping client level event logs that help with client telemetry on a remote management station such as Aruba Central. By default, client level event logs are disabled. The **no** form of this command disables client-level event logs for DHCPv6 snooping after they are enabled. View these logged DHCPv6 snooping events by issuing the command `show events -c dhcpv6-snooping`.

For additional information on DHCP-related event logging, please refer to the Event Log Message Reference Guide.

Examples

Enabling DHCPv6 client level event logs:

```
switch(config)# # dhcpv6-snooping event-log client
```

Disabling external storage:

```
witch(config)# # no dhcpv6-snooping event-log client
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping external-storage

```
dhcpv6-snooping external-storage volume <VOL-NAME> file <FILE-NAME>
no dhcpv6-snooping external-storage volume <VOL-NAME> file <FILE-NAME>
```

Description

Configures external storage to be used for backing up IPv6 bindings (used by DHCPv6 snooping) to a file. When configured, the switch stores all the IP bindings in an external storage file so that they are retained after the switch restarts. When the switch restarts, it reads the IPv6 bindings from the configured external storage file to populate its local cache.

When both external storage and flash storage are configured to store DHCP snooping IP bindings, the external storage takes priority, and is used exclusively until it becomes unconfigured, at which time flash storage (if configured) is used. Later, if external storage is configured again, flash storage stops and external storage resumes.

The no form of this command disables the saving of IPv6 bindings in an external storage file.

Parameter	Description
`volume <VOL-NAME>`	Specifies the name of the existing external storage volume where the IPv6 bindings file will be saved. Before running the `dhcpv6-snooping external-storage volume` command, first create the external storage volume using command `external-storage <VOLUME-NAME>`. See *External storage commands* in the *Command-Line Interface Guide*.
`file <FILE-NAME>`	Specifies the file name to use for storing IPv6 bindings. Maximum 255 characters.

Examples

Configuring IPv6 bindings storage in file `ipv6Bindings` on existing volume `dhcp_snoop`:

```
switch(config)# dhcpv6-snooping external-storage volume dhcp_snoop file
ipv6Bindings
```

Disabling external storage:

```
switch(config)# no dhcpv6-snooping external-storage volume dhcp_snoop
```

Disabling external storage when flash storage is also configured (note the message indicating that flash storage will be used):

```
switch(config)#  no dhcpv6-snooping external-storage volume dhcp_snoop
DHCPv6-Snooping will use flash storage to store IP Binding database
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.08	Updated example with flash storage information.
10.07 or earlier	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping flash-storage

```
dhcpv6-snooping flash-storage [delay <DELAY>]
no dhcpv6-snooping flash-storage [delay <DELAY>]
```

Description

Configures switch flash storage to be used for backing up client IP bindings (used by DHCPv6 snooping). When flash storage is configured (and external storage is not already configured for this purpose), the switch stores the IP bindings in switch flash storage. When the switch restarts, it reads the IP bindings from the switch flash storage to populate its local cache.

Writing the IP bindings to flash storage only occurs after the configured delay and if there has been a change in client IP bindings. Writing is skipped when client IP bindings have not changed since the previous write.

Omitting `delay <DELAY>` sets the default delay of 900 seconds.

To reduce switch flash aging it is recommended that you use external storage (command `dhcpv6-snooping external-storage`) to backup DHCP snooping IP bindings. Alternatively, consider configuring flash storage with a substantial delay between writes.

When both external storage and flash storage are configured to store DHCP snooping IP bindings, the external storage takes priority, and is used exclusively until it becomes unconfigured, at which time flash storage (if configured) is used. Later, if external storage is configured again, flash storage stops and external storage resumes.

The no form of this command disables the saving of IP bindings in flash storage.

Parameter	Description
`delay <DELAY>`	Specifies the delay in seconds between writes (when necessary) to the flash storage, Default: 900. Range: 300 to 86400.

Examples

Configuring switch flash storage for DHCP snooping IP binding storage with a write delay of 1200 seconds:

```
switch(config)# dhcpv6-snooping flash-storage delay 1200
Warning: Using flash storage reduces switch lifetime. It is recommended to use an
external-storage.
Do you want to continue  (y/n)? y
switch(config)#
```

Unconfiguring usage of switch flash storage for IP bindings :

```
switch(config)# no dhcpv6-snooping flash-storage
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping max-bindings

```
dhcpv6-snooping max-bindings <MAX-BINDINGS>
no dhcpv6-snooping max-bindings <MAX-BINDINGS>
```

Description

Sets the maximum number of DHCPv6 bindings allowed on the selected interface. For all interfaces on which this command is not run, the default max binding is the maximum value of the range.

The no form of the command reverts max bindings for the selected interface to its default.

Parameter	Description
<MAX-BINDINGS>	Specifies the maximum number of DHCP bindings. Range 1 to 8192.

Examples

On the 6400 Switch Series, interface identification differs.

Set the DHCPv6 max bindings to 256 on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# dhcpv6-snooping max-bindings 256
switch(config-if)# exit
switch(config)#
```

Revert DHCPv6 max bindings to its default on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no dhcpv6-snooping max-bindings 256
switch(config-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping trust

```
dhcpv6-snooping trust
no dhcpv6-snooping trust
```

Description

Enables DHCPv6 snooping trust on the selected interface. Only server packets received on trusted interfaces are forwarded. All the interfaces are untrusted by default.

The no form of the command disables DHCPv6 snooping trust on the selected interface.

```
config-if
```

Examples

On the 6400 Switch Series, interface identification differs.

Enabling DHCPv6 snooping trust on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# dhcpv6-snooping trust
switch(config-if)# exit
switch(config)#
```

Disabling DHCPv6 snooping trust on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# no dhcpv6-snooping trust
switch(config-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

dhcpv6-snooping tunnel vxlan trust

```
dhcpv6-snooping tunnel vxlan trust
no dhcpv6-snooping tunnel vxlan trust
```

Description

Enables DHCPv6-snooping trust on all VxLAN tunnels.

The no form of the command to marks all VxLAN tunnels as untrusted.

By default, all VxLAN tunnel interfaces are trusted. When trust is disabled on VxLAN tunnel interfaces:

- DHCP broadcast packets are not forwarded on VxLAN tunnels.
- DHCP server packets received on VxLAN tunnel interfaces are discarded.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling trust on all VxLAN tunnel interfaces:

```
switch(config)# dhcpv6-snooping tunnel vxlan trust
```

Disabling trust on all VxLAN tunnel interfaces:

```
switch(config)# no dhcpv6-snooping tunnel vxlan trust
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.11.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

match client prefix-list

```
match client prefix-list <PREFIX-LIST-NAME>
no match client prefix-list <PREFIX-LIST-NAME>
```

Description

Configures a prefix-list for the DHCPv6 snooping guard policy enabling the policy to allow the assigned IPv6 addresses within a specific prefix range.

The **no** form of the command removes a prefix list from the DHCPv6 snooping guard policy.

Parameter	Description
<PREFIX-LIST-NAME>	Specifies the name of the IPv6 prefix list.

Examples

Adding a prefix list named pref1 to the pol1 DHCPv6 snooping guard policy:

```
switch(config)# ipv6 prefix-list pref1 permit 2001:db8::/64 le 128
switch(config)# dhcpv6-snooping guard-policy pol1
switch(config-dhcpv6-guard-policy)# match client prefix-list pref1
```

Deleting the prefix list named prf1 from the pol1 DHCPv6 snooping guard policy:

```
switch(config)# dhcpv6-snooping guard-policy pol1
switch(config-dhcpv6-guard-policy)# no match client prefix-list <ipv6-prefix-list-
name>
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-guard-policy`	Administrators or local user group members with execution rights for this command.

match server access-list

```
match server access-list <ACL-NAME>
no match server access-list <ACL-NAME>
```

Description

Configures an access list to a DHCPv6 snooping guard policy, enabling the DHCPv6 snooping guard policy to allow or deny the specific DHCP server to assign an IPv6 address. If no filters are applied, DHCP server traffic from any source IP address is allowed in the trusted port.

The **no** form of the command removes the specified access list from the DHCPv6 snooping guard policy.

Parameter	Description
<ACL-NAME>	Specifies the name of the IPv6 access list to be matched.

Examples

Creating an access-list acl1 on DHCPv6 snooping guard policy pol1 :

```
switch(config)# dhcpv6-snooping guard-policy pol1
switch(config-dhcpv6-guard-policy)# match server access-list acl1
```

Deleting the access list acl1 from the DHCPv6 snooping guard policy pol1:

```
switch(config)# dhcpv6-snooping guard-policy pol1
switch(config-dhcpv6-guard-policy)# no match server access-list acl1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-guard-policy`	Administrators or local user group members with execution rights for this command.

preference

```
preference [minimum | maximum ] <VALUE>
no preference
```

Description

Enables a DHCPv6 snooping guard policy to allow or deny the DHCPv6 servers in the specified server preference range. If not configured the minimum preference is set to 0 and maximum preference is set to 255.

The **no** form of the command removes the server preference limits on the specified DHCPv6 snooping guard policy.

Parameter	Description
`minimum <VALUE>`	Specifies the minimum value for the server preference range. Range: 1-255.
`maximum <VALUE>`	Specifies the maximum value for the server preference range. Range: 1-255.

Examples

Setting the minimum and maximum server preference range to 6-250 on DHCPv6 snooping guard policy pol1:

```
switch(config)# dhcpv6-snooping guard-policy pol1
switch(config-dhcpv6-guard-policy)# preference min 6
switch(config-dhcpv6-guard-policy)# preference max 250
```

Disabling the server preference range on DHCPv6 snooping guard policy pol1:

```
switch(config)# dhcpv6-snooping guard-policy pol1
switch(config-dhcpv6-guard-policy)# no preference
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-dhcpv6-guard-policy`	Administrators or local user group members with execution rights for this command.

show dhcpv6-snooping guard-policy

```
show dhcpv6-snooping guard-policy[<POLICY_NAME>] [vsx-peer]
```

Description

Shows the DHCPv6 snooping guard policy configuration.

Parameter	Description
<POLICY-NAME>	Specifies the DHCPv6 snooping guard policy for which the information is displayed.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the DHCPv6 snooping guard policy configuration:

```
switch# show dhcpv6-snooping guard-policy

 DHCPv6-Snooping guard-policy Information

    DHCPV6 Guard Policy name    : POL1
    Attached Access List        : ACL1
    Attached Prefix List        : PRF1
    Preference Range            : 0-255
    Applied on VLAN             : 5,7
    Applied on Port

    DHCPV6 Guard Policy name    : POL2
    Attached Access List        : ACL2
    Attached Prefix List        : PRF2
    Preference Range            : 2-20
    Applied on VLAN
    Applied on Port             : 1/1/1, 1/1/2

    DHCPV6 Guard Policy name    : POL3
    Attached Access List        : ACL3
    Attached Prefix List        : PRF3
    Preference Range            : 3-60
    Applied on VLAN             : 4,6
    Applied on Port
```

Showing the DHCPv6 snooping guard policy configuration for the policy named POLICY_NAME1:

```
switch# show dhcpv6-snooping guard-policy POLICY_NAME1

  DHCPv6-Snooping guard-policy Information
  ========================
    DHCPV6 Guard Policy name    : POLICY_NAME1
    Attached Access List        : ACL1
    Attached Prefix List        : PRF1
    Preference Range            : 0-255
        vsx-sync
    Applied on VLAN             : 5,7
    Applied on Port             : 1/1/1, 1/1/2
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcpv6-snooping guard-policy interface

`show dhcpv6-snooping guard-policy [interface <INTERFACE-NAME>] [vsx-peer]`

Description

Shows the DHCPv6 snooping guard policy configuration and statistics for the specified interface.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface name for which the DHCPv6 guard counter information is displayed.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the DHCPv6 snooping guard policy configuration and statistics for interface 1/1/1:

```
switch# show dhcpv6-snooping guard-policy int 1/1/1
 DHCPv6 Guard Policy  Applied    : pol1
  DHCPv6 Guard Policy Counters
  ==========================

 DHCPv6 Packets Received         : 20
 DHCPv6 Packets Forwarded        : 5
 DHCPv6 Packets Dropped          : 15 [Total]
                                Access list error        [7]
                                Prefix list error        [8]
                                Server preference error  [0]
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcpv6-snooping guard-policy vlan

`show dhcpv6-snooping guard-policy [vlan <VLAN-ID>] [vsx-peer]`

Description

Shows the DHCPv6 snooping guard policy configuration and statistics for the specified VLAN.

Parameter	Description
<VLAN-ID>	Specifies the VLAN ID for which the DHCPv6 guard counter information is displayed.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the DHCPv6 snooping guard policy configuration and statistics for VLAN 100:

```
switch# show dhcpv6-snooping guard-policy vlan 2
 DHCPv6 Guard Policy  Applied    : pol1
  DHCPv6 Guard Policy Counters
  ==========================

 DHCPv6 Packets Received         : 20
 DHCPv6 Packets Forwarded        : 5
 DHCPv6 Packets Dropped          : 15 [Total]
                                Access list error        [0]
                                Prefix list error        [8]
                                Server preference error  [7]
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcpv6-snooping

```
show dhcpv6-snooping [vsx-peer]
```

Description

Shows the DHCPv6 snooping configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the DHCPv6 snooping configuration:

```
switch# show  dhcpv6-snooping

 DHCPv6-Snooping Information

  DHCPv6-Snooping      : Yes   Enabled VLANs        : 1,5,7,100-110
  Trusted Port Bindings Enabled VLANs :
  Client Event Logs                   : Yes

External Storage Information

   Volume Name           : dhcp_snoop
   File Name             : ip_binding
   Inactive Since        : 01:23:20 09/10/2021
   Error                 : Failed to write external storage

Flash Storage Information
     File Write Delay       : 300 seconds
     Active Storage         : External

Authorized Server Configurations
VRF                                          Authorized Servers
------------                                ------------------
default
2001:0db8:85a3:0000:0000:8a2e:0370:7334
```

```
default                                      2002::2
default                                      2004::1
red                                          2002::1
red                                          2002::2
red                                          2002::9
green                                        5000::1
green                                        5000::2
green                                        5000::3
green                                        5000::7
green                                        5000::8

Port Information
                         Max       Static      Dynamic
Port           Trust     Bindings  Bindings    Bindings
--------       -----     --------   --------  --------
1/1/2          Yes       0         0         0
1/1/3          Yes       0         3         0
1/1/5          Yes       0         22        0
1/1/16         No        256       0         20
10/10/10       No        256       12        7
lag120         No        256       3         0
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.08	Updated example with flash storage information.
10.07 or earlier	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcpv6-snooping binding

```
show dhcpv6-snooping binding [vsx-peer]
```

Description

Shows the DHCPv6 snooping binding configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the DHCPv6 snooping binding configuration:

```
switch# show dhcpv6-snooping binding

 IP Binding Information
 ======================
 MAC-ADDRESS       IPV6-ADDRESS                              VLAN  INTERFACE
TIME-LEFT
 ----------------  ----------------------------------------  ----  ---------  ----
------
 00:50:56:96:e4:cf aaaa:bbbb:cccc:dddd:eeee:1234:5678:abcd      1      1/1/1
  584
 00:50:56:96:04:4d 1000::3                                    134      1/1/2
  435
 00:50:56:96:d8:3d 2000:1000::4                              2002     lag123
21234
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show dhcpv6-snooping statistics

`show dhcpv6-snooping statistics [vsx-peer]`

Description

Shows the DHCPv6 snooping statistics.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing the DHCPv6 snooping statistics:

```
switch(config)# show dhcpv6-snooping statistics

 Packet-Type  Action   Reason                         Count
 -----------  -------  -----------------------------  ---------
 server       forward  from trusted port              12
 client       forward  to trusted port                20
 server       drop     received on untrusted port     5
 server       drop     unauthorized server            4
 client       drop     destination on untrusted port  2
 client       drop     bad DHCP release request       5
 server       drop     relay reply on untrusted port  2
 client       drop     failed on max-binding limit    5
```

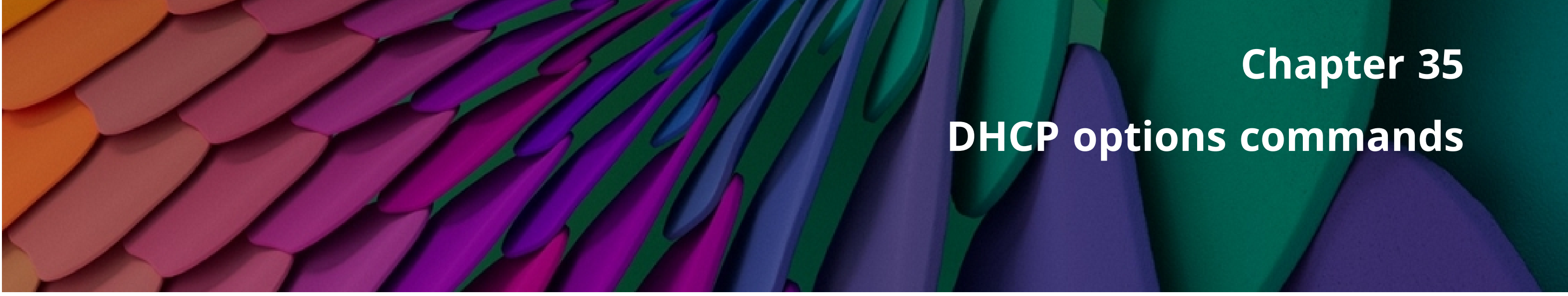
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced for the 8360 Switch Series.
10.09	Command introduced for the 6000 and 6100 Switch Series.
10.07 or earlier	

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 35

DHCP options commands

http-proxy

```
http-proxy {<FQDN | IPV4-ADDR> | IPV6-ADDR[:PORT]} [vrf <VRF-NAME>]
no http-proxy [<FQDN | IPV4-ADDR>] [vrf <VRF-NAME>]
```

Description

Specifies HTTP proxy location and VRF.

When HTTP proxy location and VRF are configured on the switch, it overrides any existing HTTP proxy location and VRF as this has the highest priority over the values obtained from other sources.

Following locations can be used for the HTTP proxy location:

- A fully qualified domain name (FQDN).
- An IPv4 address with colon separated port number
- An IPv6 address with colon separated port number

When configuring an IPv6 address with a port number, the address must be specified inside square brackets. An example - [2001:0db8:85a3:0000:0000:8a2e:0370:7334]:8080.

If the command is entered without the VRF parameter, then the VRF used will be 'default' VRF.

The **no** form of this command removes a specified HTTP proxy location.

Parameter	Description
<FQDN>	Specifies FQDN for HTTP proxy location.
<IPV4-ADDR>	Specifies IPV4 address for HTTP proxy location.
<IPV6-ADDR>	Specifies IPV6 address for HTTP proxy location.
<VRF-NAME>	Specifies VRF for HTTP proxy.

A FQDN or IPV4 address are optional in the **no** form of the command.

Examples

Specifying a FQDN for HTTP proxy location and MGMT VRF:

```
switch(config)# http-proxy http-proxy.aruba.com vrf mgmt
switch(config)# http-proxy [2000::100]:8080 vrf mgmt
```

Removing HTTP proxy location

```
switch(config)# no http-proxy
```

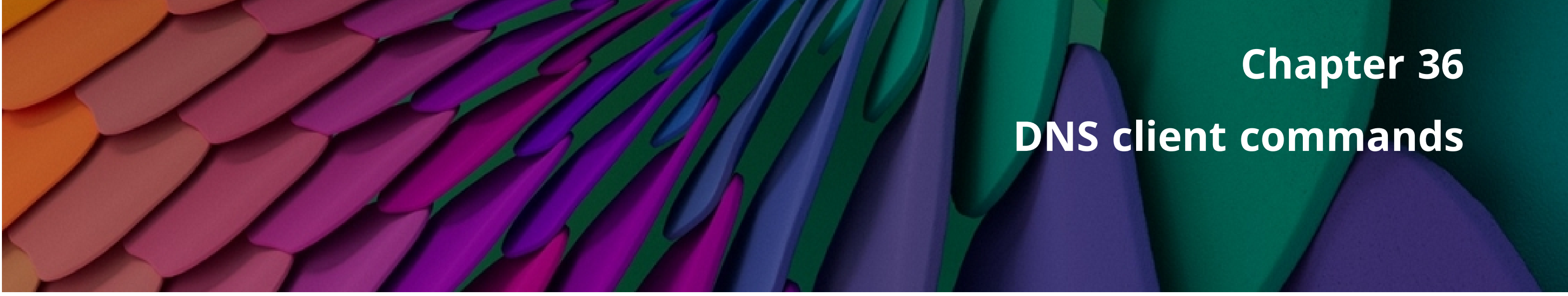
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command updated to reflect OTP scenario.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.



Chapter 36
DNS client commands

ip dns domain-list

```
ip dns domain-list <DOMAIN-NAME> [vrf <VRF-NAME>]
no ip dns domain-list <DOMAIN-NAME> [vrf <VRF-NAME>]
```

Description

Configures one or more domain names that are appended to the DNS request. The DNS client appends each name in succession until the DNS server replies. Domains can be either IPv4 or IPv6. By default, requests are forwarded on the default VRF.

The **no** form of this command removes a domain from the list.

Parameter	Description
`list <DOMAIN-NAME>`	Specifies a domain name. Up to six domains can be added to the list. Length: 1 to 256 characters.
`vrf <VRF-NAME>`	Specifies a VRF name. Default: default.

Examples

This example defines a list with two entries: **domain1.com** and **domain2.com**.

```
switch(config)# ip dns domain-list domain1.com
switch(config)# ip dns domain-list domain2.com
```

This example defines a list with two entries, **domain2.com** and **domain5.com**, with requests being sent on **mainvrf**.

```
switch(config)# ip dns domain-list domain2.com vrf mainvrf
switch(config)# ip dns domain-list domain5.com vrf mainvrf
```

This example removes the entry **domain1.com**.

```
switch(config)# no ip dns domain-list domain1.com
```

For more information on features that use this command, refer to the Fundamentals Guide or the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ip dns domain-name

```
ip dns domain-name <DOMAIN-NAME> [ vrf <VRF-NAME> ]
no ip dns domain-name <DOMAIN-NAME> [ vrf <VRF-NAME> ]
```

Description

Configures a domain name that is appended to the DNS request. The domain can be either IPv4 or IPv6. By default, requests are forwarded on the default VRF. If a domain list is defined with the command `ip dns domain-list`, the domain name defined with this command is ignored.

The **no** form of this command removes the domain name.

Parameter	Description
<DOMAIN-NAME>	Specifies the domain name to append to DNS requests. Length: 1 to 256 characters.
`vrf` *<VRF-NAME>*	Specifies a VRF name. Default: default.

Examples

Setting the default domain name to `domain.com`:

```
switch(config)# ip dns domain-name domain.com
```

Removing the default domain name `domain.com`:

```
switch(config)# no ip dns domain-name domain.com
```

For more information on features that use this command, refer to the Fundamentals Guide or the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ip dns host

```
ip dns host <HOST-NAME> <IP-ADDR> [ vrf <VRF-NAME> ]
no ip dns host <HOST-NAME> <IP-ADDR> [ vrf <VRF-NAME> ]
```

Description

Associates a static IP address with a hostname. The DNS client returns this IP address instead of querying a DNS server for an IP address for the hostname. Up to six hosts can be defined. If no VRF is defined, the default VRF is used.

The **no** form of this command removes a static IP address associated with a hostname.

Parameter	Description
`host <HOST-NAME>`	Specifies the name of a host. Length: 1 to 256 characters.
`<IP-ADDR>`	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (`xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx`), where **x** is a hexadecimal number from 0 to F.
`vrf <VRF-NAME>`	Specifies a VRF name. Default: default.

Examples

This example defines an IPv4 address of **3.3.3.3** for **host1**.

```
switch(config)# ip dns host host1 3.3.3.3
```

This example defines an IPv6 address of **b::5** for **host 1**.

```
switch(config)# ip dns host host1 b::5
```

This example defines removes the entry for **host 1** with address **b::5**.

```
switch(config)# no ip dns host host1 b::5
```

For more information on features that use this command, refer to the Fundamentals Guide or the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ip dns server address

```
ip dns server-address <IP-ADDR> [ vrf <VRF-NAME> ]
no ip dns server-address <IP-ADDR> [ vrf <VRF-NAME> ]
```

Description

Configures the DNS name servers that the DNS client queries to resolve DNS queries. Up to six name servers can be defined. The DNS client queries the servers in the order that they are defined. If no VRF is defined, the default VRF is used.

The **no** form of this command removes a name server from the list.

Parameter	Description
`<IP-ADDR>`	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (`xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx`), where **x** is a hexadecimal number from 0 to F.
`vrf` *`<VRF-NAME>`*	Specifies a VRF name. Default: default.

Examples

This example defines a name server at **1.1.1.1**.

```
switch(config)# ip dns server-address 1.1.1.1
```

This example defines a name server at **a::1**.

```
switch(config)# ip dns server-address a::1
```

This example removes a name server at **a::1**.

```
switch(config)# no ip dns server-address a::1
```

For more information on features that use this command, refer to the Fundamentals Guide or the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show ip dns

`show ip dns [vrf <VRF-NAME>][vsx-peer]`

Description

Shows all DNS client configuration settings or the settings for a specific VRF.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the VRF for which to show information. If no VRF is defined, the default VRF is used.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

These examples define DNS settings and then show how they are displayed with the `show ip dns` command.

```
switch(config)# ip dns domain-name domain.com
switch(config)# ip dns domain-list domain5.com
switch(config)# ip dns domain-list domain8.com
switch(config)# ip dns server-address 4.4.4.4
switch(config)# ip dns server-address 6.6.6.6
switch(config)# ip dns host host3 5.5.5.5
switch(config)# ip dns host host2 2.2.2.2
switch(config)# ip dns host host3 c::12
switch(config)# ip dns domain-name reddomain.com vrf red
switch(config)# ip dns domain-list reddomain5.com vrf red
switch(config)# ip dns domain-list reddomain8.com vrf red
switch(config)# ip dns server-address 4.4.4.5 vrf red
switch(config)# ip dns server-address 6.6.6.7 vrf red
switch(config)# ip dns host host3 5.5.5.6 vrf red
switch(config)# ip dns host host2 2.2.2.3 vrf red
switch(config)# ip dns host host3 c::13 vrf red
switch# show ip dns
VRF Name : default

Domain Name : domain.com
DNS Domain list : domain5.com, domain8.com
Name Server(s) : 4.4.4.4, 6.6.6.6

Host Name    Address
-------------------------------
host2            2.2.2.2
host3            5.5.5.5
host3            c::12
```

```
VRF Name : red

Domain Name : reddomain.com
DNS Domain list : reddomain5.com, reddomain8.com
Name Server(s) : 4.4.4.5, 6.6.6.7

Host Name    Address
-------------------------------
host2            2.2.2.3
host3            5.5.5.6
host3            c::13
```

```
switch(config)# ip dns domain-name domain.com vrf red
switch(config)# ip dns domain-list domain5.com vrf red
switch(config)# ip dns domain-list domain8.com vrf red
switch(config)# ip dns server-address 4.4.4.4 vrf red
switch(config)# ip dns server-address 6.6.6.6 vrf red
switch(config)# ip dns host host3 5.5.5.5 vrf red
switch(config)# no ip dns host host2 2.2.2.2 vrf red
switch(config)# ip dns host host3 c::12 vrf red

switch# show ip dns vrf red
VRF Name : red

Domain Name : domain.com
DNS Domain list : domain5.com, domain8.com
Name Server(s) : 4.4.4.4, 6.6.6.6

Host Name    Address
-------------------------------
host3            5.5.5.5
host3            c::12
```

DNS client arbitration on the MGMT interface on a MGMT VRF can be updated via three different methods.

1. Using the **domain-name <name>** or **nameservers <servers>** commands in the command-line interface.
2. Using the **ip dns domain-name <*DOMAIN-NAME*> vrf *MGMT*** or **ip dns server-address <SERVER> vrf MGMT** commands in the command-line interface.
3. Using the **ip dhcp** command in the command-line interface (dynamic enties).

AOS-CX gives the following priority levels to the these three update mothods.

- Priority 1 - standalone CLI configuration
- Priority 2 - static ip dns configuration
- Priority 3 - Dynamic config

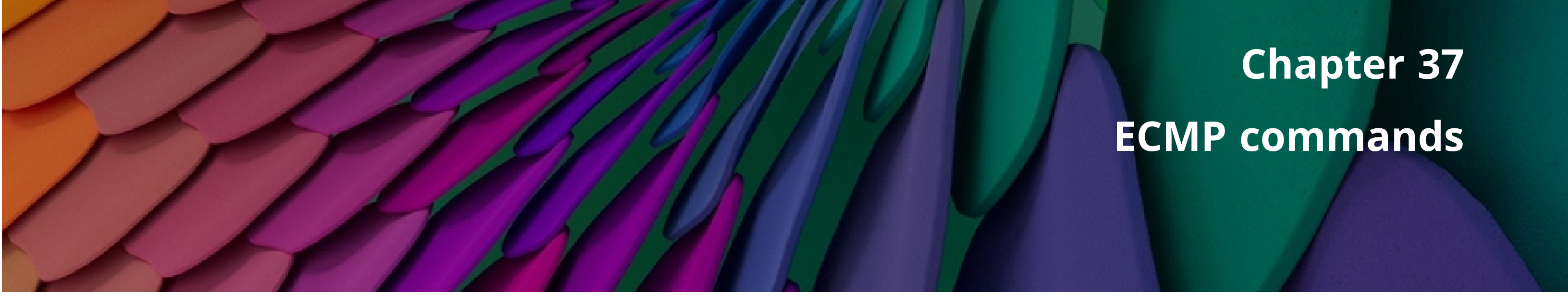
For more information on features that use this command, refer to the Fundamentals Guide or the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 37

ECMP commands

show ip ecmp

`show ip ecmp [vsx-peer]`

Description

Displays the Equal Cost Multipath (ECMP) configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show ip ecmp

ECMP Configuration
---------------------

 ECMP Status         : Enabled

ECMP Load Balancing by
------------------------
 Source IP           : Enabled
 Destination IP      : Enabled
 Source Port         : Enabled
 Destination Port    : Enabled
```

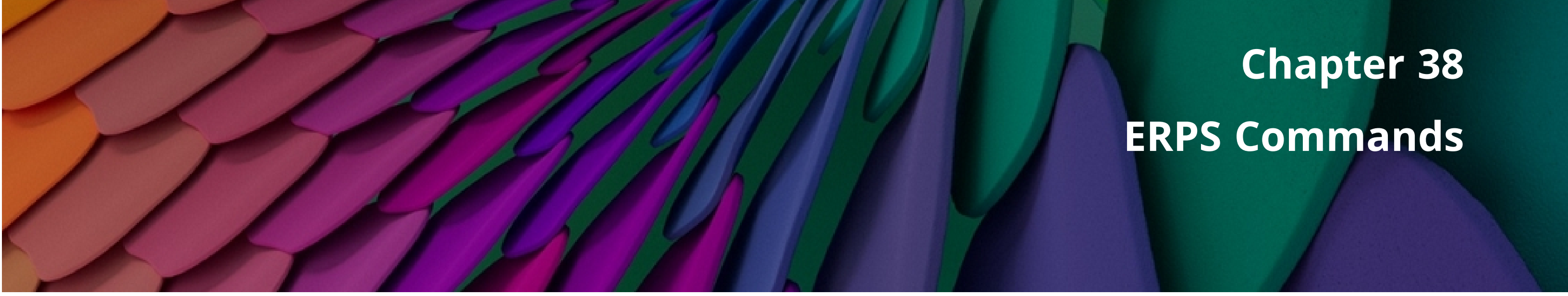
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 38

ERPS Commands

clear erps ring <RINGID> instance <ID>

```
clear erps ring <RINGID> instance <ID>
```

Description

Removes the protection switching and triggers reversion both in revertive and non-revertive operation. This command will not change the configured revertive operation mode.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239.
<ID>	Required, specifies the ID of the ring instance. Range: 1-2.

Examples

Removes the protection switching and triggers reversion for ring 3, instance 2:

```
switch# clear erps ring 3 instance 2
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear erps statistics

```
clear erps statistics [ring <ID>] [instance <ID>]
```

Description

This command clears the ERPS statistics for a ring or a ring instance.

Parameter	Description
<RINGID>	Optional, specifies the ID of the ring. Range: 1-239.
<ID>	Optional, specifies the ID of the ring instance. Range: 1-64.

Examples

Clear ERPS statistics for ring 1:

```
switch# clear erps statistics ring 1
```

Clear ERPS statistics for instance 1 of ring 1:

```
switch# clear erps statistics ring 1 instance 1
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

erps ring

```
erps ring <RINGID>
no erps ring <RINGID>
```

Description

This command creates an ERPS ring with a given ID.

The **no** form of this command removes all the configurations of the ring, including instances.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239

Examples

Create an ERPS ring:

```
switch(config)# erps ring 2
switch(config-ring-2)#
```

Remove an ERPS ring:

```
switch(config)# no erps ring 2
switch(config-ring-2)#
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> <port0|port1> interface

```
erps ring <RINGID>
        <port0|port1> interface <ifname>
```

Description

This command configures the ERPS ring member port. An L2 interface in the switch is associated to one of the two member ports of an ERPS ring. In case of an interconnection node, only port0 is applicable for the sub-ring.

The **no** form of this command removes the association of the ring port to the L2 interface on the switch.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<PORT0>	Required, set port0 of the ring.
<PORT1>	Required, set port1 of the ring.
<ifname>	Required, interface name (string).

Examples

Configure the ERPS ring member port:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# port0 interface 1/1/1
```

Remove the association of the ring port to the L2 interface on the switch:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# no port0
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> description

```
erps ring <RINGID>
        description <LINE>
```

Description

This command adds descriptive information to help administrators and operators understand the purpose of a ring. 1-64 printable ASCII characters are allowed.

The **no** form of this command removes the ring instance description.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<LINE>	Required, specifies the description text. Maximum length is 64 characters.

Examples

Add descriptive information to a ring:

```
switch(config)# erps ring 3
switch(config-erps-ring-3) description HPE RnD ring
```

Remove descriptive information from a ring:

```
switch(config)# erps ring 3
switch(config-erps-ring-3) no description
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> guard-interval

```
erps ring <RINGID>
        guard-interval <10 milliseconds>
```

Description

Guard timer is used in nodes recovering from a local failure to avoid loops due to earlier Signal Fail (SF) messages that may be in the ring.

The configuration specifies the guard timer duration in units of 10 ms. The timer period must be greater than the maximum expected forwarding delay in which an R-APS message traverses the entire ring. The default value is 50.

The **no** form of this command removes the configured value of the guard interval and sets it to the default value of 50.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<10 milliseconds>	Required, specifies the guard timer duration in units of 10 ms. Default: 50.

Examples

Specify the guard timer duration:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)#  guard-interval 100
```

Remove the configured value of the guard interval and set it to the default value of 50:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# no guard-interval
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> hold-off-interval

```
erps ring <RINGID>
        hold-off-interval <100 milliseconds>
```

Description

Specifies hold-off interval in units of 100 ms. If specified, a defect is not reported immediately. Instead, the hold-off timer is started. On expiration of the timer, if the defect still exists, it is reported to protection switching. The default value for hold-off timer is 0.

The **no** form of this command removes the configured value of the hold-off interval and sets it to the default value of 0.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<100 milliseconds>	Required, specifies the hold-off interval in units of 100 ms. Default: 0.

Examples

Specify the hold-off interval:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# hold-off-interval 100
```

Remove the configured value of the hold-off interval and set it to the default value of 0:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# no hold-off-interval
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance

```
erps ring <RINGID>
       instance <ID>
```

Description

On a common ERPS network, a physical ring can be configured with a single ERPS ring, and only one blocked port can be specified in the ring. When the ERPS ring is in normal state, the blocked port prohibits all service packets from passing through. As a result, all service data is transmitted through one path over the ERPS ring, and the other link on the blocked port becomes idle, leading to ineffective use of bandwidth.

To improve link use efficiency, logical rings can be configured in the same physical ring in the ERPS multi-instance. A port may have different roles in different ERPS rings and different ERPS rings use different control VLANs.

An ERPS ring must be configured with an ERP instance, and each ERP instance specifies a range of VLANs. The topology calculated for a specific ERPS ring only takes effect in the ERPS ring. Different VLANs can use separate paths, implementing traffic load balancing and link backup.

The **no** form of this command removes the instance of the ring.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.

Examples

Create a ring instance:

```
switch(config)# erps ring 3
switch(config-ring-3)# instance 2
```

Remove a ring instance:

```
switch(config)# erps ring 3
switch(config-ring-3)# no instance 2
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance <ID> control-vlan

```
erps ring <RINGID>
        instance <ID> control-vlan <VID>
```

Description

This command adds a control-channel VLAN to a ring instance. In an ERPS ring, the control VLAN should be used only to forward RAPS PDUs and not service packets. All the devices in an ERPS ring instance must be configured with the same control VLAN, and different ERPS ring instances must use different control VLANs.

The **no** form of this command removes the control-channel VLAN of the ring instance.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.
<VID>	Required, VLAN ID. Range: 1-4094.

Examples

Add a control-channel VLAN to a ring instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) control-vlan 10
```

Remove the control-channel VLAN of the ring instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) no control-vlan
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance <ID> description

```
erps ring <RINGID>
        instance <ID> description <LINE>
```

Description

This command adds descriptive information to help administrators and operators understand the purpose of a ring instance. 1-64 printable ASCII characters are allowed.

The **no** form of this command removes the ring instance description.

Command context

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.
<LINE>	Required, descriptive information about the ring instance. 1-64 printable ASCII characters allowed.

Examples

Add ring instance description:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) description HPE RnD DataVlan
```

Remove ring instance description:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) no description
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance <ID> enable

```
erps ring <RINGID>
        instance <ID> enable
```

Description

This configuration enables protection switching on the given instance of the ring. It is disabled by default.

The **no** form of this command disables protection switching on the given instance of the ring.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.

Examples

Enable protection switching on the given instance of the ring:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) enable
```

Disable protection switching on the given instance of the ring:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) no enable
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance <ID> protected-vlans

```
erps ring <RINGID>
        instance <ID> protected-vlans <VID-LIST>
```

Description

This command specifies the set of VLANs that are protected by this ring instance.

The **no** form of this command removes a set of VLANs that are protected by this ring instance.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.
<VID-LIST>	Required, range of VLANs to be protected by this ring instance. Range: 1-4094.

Examples

Specify a set of VLANs that are protected by this ring instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) protected-vlans 1,10-50
```

Remove a set of VLANs that are protected by this ring instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) no protected-vlans 11,13
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance <ID> protection-switch {{manual|force} <PORT0>|<PORT1>}

```
erps ring <RINGID> instance <ID> protection-switch {{manual|force} <PORT0>|<PORT1>}
```

Description

Blocks a specific ring interface in one of the two following ways:

- Force: The switch blocks a specific ring interface regardless of the protection switching state of the ring instance.
- Manual: The switch blocks a specific ring interface if no other protection switch event is active on the ring instance.

The user can verify whether the protection-switch is successful by verifying the status of instance and port state over which this command is executed.

```
switch# erps ring 1 instance  1 protection-switch force port0
switch# show erps  status
Status for ERPS Ring 1 Instance 1:
====================================
Ring ID                       : 1
Instance ID                   : 1
Port0                         : 1/1/5 (Block)
Port1                         : 1/1/6 (Up)
Node Role (RPL)               : Owner (port0)
Control VLAN                  : 50
Protected VLAN                : 1-49
Subring (TCN)                 : No (No)
Revertive Operation           : Revertive
MEG Level                     : 7
Transmission Interval         : 5 sec
Guard Interval                : 0 sec 500 ms
Hold-Off Interval             : 0 sec 0 ms
WTR Interval                  : 1 min
Status                        : Forced-switch
Oper Down Reason              : None
```

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.
manual	A type of protection switch event in which the switch blocks a specific ring interface if no other protection switch event is active on the ring instance.
force	A type of protection switch event in which the switch blocks a specific ring interface regardless of the protection switching state of the ring instance.

Examples

Block ring 3, interface 2, port 0 if no other protection switch event is active on the ring instance:

```
switch# erps ring 3 instance 2 protection-switch manual port0
```

Block ring 3, instance 2, regardless of the protection switching state of the ring instance:

```
switch# erps ring 3 instance 2 protection-switch force port1
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

erps ring <RINGID> instance <ID> revertive

```
erps ring <RINGID> instance <ID> revertive
```

Description

Configures the default revertive mode of operation for an ERPS ring. In revertive operation, after the conditions causing protection switching are cleared, traffic channels are restored to the recovered link blocking the RPL. This configuration is meaningful only on the RPL node.

The **no** form of this command configures non-revertive mode of operation for an ERPS ring. In non-revertive operation, the traffic channels continue to use the RPL, if it has not failed, after conditions causing protection switching are cleared. This configuration is meaningful only on the RPL node.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.

Examples

Configuring the default revertive mode of operation for ERPS ring 3, instance 2:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2)# revertive
```

Configuring non-revertive mode of operation for ERPS ring 3, instance 2:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2)# no revertive
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance <ID> role

```
erps ring <RINGID>
        instance <ID> role <RPL-OWNER|RPL-NEIGHBOR>
```

Description

In ERPS, there is a central node called RPL Owner Node which blocks one of the ports to ensure that there is no loop formed for the Ethernet traffic. The link blocked by the RPL owner node is called the Ring Protection Link or RPL. The node at the other end of the RPL is known as RPL Neighbor Node. It uses R-APS control messages to coordinate the activities of switching on/off the RPL link.

This command specifies the role of the node as owner or neighbor.

The **no** form of this command removes the configuration of the node role from the instance.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.
<RPL-OWNER>	Blocks traffic at one end of the RPL. The blocked end sends out periodic R-APS.
<RPL-NEIGHBOR>	Blocks traffic at one end of the RPL. The blocked end does not generate periodic R-APS.

Examples

Specify the role of the node as owner:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) role rpl-owner
```

Specify the role of the node as neighbor:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 3
switch(config-erps-ring-3-inst-2) role rpl-neighbour
```

Remove the configuration of the node role from the instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) no role
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-erps-ring-*<ringid>*	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> instance <ID> rpl

```
erps ring <RINGID>
        instance <ID> rpl <port0|port1>
```

Description

In ERPS, there is a central node called RPL Owner Node which blocks one of the ports to ensure that there is no loop formed for the Ethernet traffic. The link blocked by the RPL owner node is called the Ring Protection Link or RPL. The node at the other end of the RPL is known as RPL Neighbor Node. It uses R-APS control messages to coordinate the activities of switching the RPL link on and off.

This command specifies which of the ERPS ring ports is the RPL.

The **no** form of this command removes the RPL port configuration from the ERPS ring instance.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<ID>	Required, specifies the ERPS ring instance identifier. Range: 1-2.
<PORT0>	Required, configure port0 to be RPL port in this ERPS ring instance.
<PORT1>	Required, configure port1 to be RPL port in this ERPS ring instance.

Examples

Configure port0 to be RPL port in this ERPS ring instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) role rpl-owner
switch(config-erps-ring-3-inst-2) rpl port0
```

Configure port1 to be RPL port in this ERPS ring instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 3
switch(config-erps-ring-3-inst-2) role rpl-neighbour
switch(config-erps-ring-3-inst-2) rpl port1
```

Remove the RPL port configuration from the ERPS ring Instance:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# instance 2
switch(config-erps-ring-3-inst-2) no rpl port0
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> meg-level

```
erps ring <RINGID>
        meg-level <-0-7>
```

Description

The R-APS messages transmitted by ERPS take the form of OAM PDUs as defined in G.8013. Each OAM PDU is transmitted at a specified level known as the Maintenance Entity Group (MEG) level. This command configures the level with which the ERPS packets must be transmitted.

The **no** form of this command removes the configured MEG level and sets it to the default value of 7.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<0-7>	Required, specifies the meg-level. Range: 0-7. Default: 7.

Examples

Specify the meg-level:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# meg-level 4
```

Remove the configured meg-level and set it to the default value of 7:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# no meg-level
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> parent-ring

```
erps ring <RINGID>
        parent-ring <RINGID>
```

Description

This command associates a sub-ring to a parent-ring and is required for the sub-ring to notify the parent-ring on change in topology.

The **no** form of this command removes the parent ring identifier.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<RINGID>	Required, specifies the ID of the parent-ring. Range: 1-239

Examples

Associate a sub-ring to a parent-ring:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)#  parent-ring 2
```

Remove a parent-ring identifier:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# no parent-ring 2
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> sub-ring

```
erps ring <RINGID>
        sub-ring
```

Description

This command is to configure a sub-ring. If not specified, the ring is a major-ring.

The **no** form of this command removes the sub-ring configuration of the ring and configures it to be a major-ring.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239

Examples

Configure a sub-ring:

```
switch(config)# erps ring 2
switch(config-erps-ring-2)# sub-ring
```

Remove the sub-ring configuration from ring 2 and configure it to be a major-ring:

```
switch(config)# erps ring 2
switch(config-erps-ring-2)# no sub-ring
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> tcn-propogation

```
erps ring <RINGID>
        tcn-propogation
```

Description

This command is to configure a sub-ring interconnection node to pass a topology change notification to the ring instance for the parent ring whenever the topology of the sub-ring changes. The parent ring instance performs a Forwarding Database (FDB) flush and sends a protocol message to ensure that other nodes on the parent ring also perform an FDB flush.

The **no** form of this command disables topology change notifications.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239

<RINGID>
Required, specifies the ID of the ring. Range: 1-239

Examples

Configure topology change notifications:

```
switch(config)# erps ring 2
switch(config-erps-ring-2)# tcn-propogation
```

Disable topology change notifications:

```
switch(config)# erps ring 2
switch(config-erps-ring-2)# no tcn-propogation
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> transmission-interval

```
erps ring <RINGID>
        transmission-interval <SECONDS>
```

Description

Specifies the R-APS periodic transmission interval in units of seconds. Default is 5 seconds.

The **no** form of this command removes the configured value of the transmission interval and sets it to the default value of 5 seconds.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<SECONDS>	Required, specifies the R-APS periodic transmission interval in units of seconds. Range: 5 seconds.

Examples

Specify the R-APS periodic transmission interval as 10 seconds:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)#  transmission-interval 10
```

Remove the configured value of the transmission interval and set it to the default value of 5 seconds:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# no transmission-interval
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

erps ring <RINGID> wtr-interval

```
erps ring <RINGID>
        wtr-interval <MINUTES>
```

Description

The RPL owner node uses a delay timer before initiating an RPL block in case of both revertive mode of operation or before reverting to idle state after clearing operator commands (FS, MS).

The Wait to Restore (WTR) timer can be configured in 1-minute increments up to 12 minutes. The default value is 5 minutes. When recovering from an SF, the delay timer must be long enough to allow the recovering network to become stable. In the default revertive mode of operation, the WTR timer is used to prevent frequent operation of protection switching due to intermittent SF defects.

The **no** form of this command removes the configured value of the wtr-interval and sets it to the default value of 5 minutes.

Parameter	Description
<RINGID>	Required, specifies the ID of the ring. Range: 1-239
<MINUTES>	Required, specifies the wtr-interval in minutes. Range: 1-12. Default: 5.

Examples

Specify the wtr-interval:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# wtr-interval 7
```

Remove the configured value of the wtr-interval and set it to the default value of 5 minutes:

```
switch(config)# erps ring 3
switch(config-erps-ring-3)# no wtr-interval
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-erps-ring-<ringid>`	Administrators or local user group members with execution rights for this command.

show erps statistics

`show erps statistics [ring <RINGID>] [instance <ID> [<PORT0>|<PORT1>]]`

Description

This command displays ERPS statistics. The statistics can be displayed for the ring, the instance, or the instance ports.

Parameter	Description
<RINGID>	Optional, specifies the ID of the ring. Range: 1-239.
<ID>	Optional, specifies the ID of the ring instance. Range: 1-2.
<PORT0>	Optional, specifies the ring member port 0.
<PORT1>	Optional, specifies the ring member port 1.

Examples

```
switch# show erps statistics ring 1

Statistics for ERPS ring 1 instance 1:
======================================
                Port0                  Port1
                -----                  -----
Local Failures  4                      1

R-APS           Port0(Tx/Rx)           Port1(Tx/Rx)
-----           ------------           ------------
NR              1/1                    1/1
```

```
NR,RB           0/1                    0/1
SF              1/0                    1/0
MS              0/0                    0/10
FS              30/0                   0/0

Statistics for ERPS ring 1 instance 2:
======================================
                Port0                  Port1
                -----                  -----
Local Failures  4                      1
R-APS           Port0(Tx/Rx)           Port1(Tx/Rx)
-----           ------------           ------------
NR              1/1                    1/1
NR,RB           0/1                    0/1
SF              1/0                    1/0
MS              0/0                    0/10
FS              30/0                   0/0
```

```
switch# show erps  statistics
Statistics for ERPS Ring 1   Instance 1  :
==========================================
                Port0                  Port1
                -----                  -----
Local Failures  4                      1
R-APS           Port0(Tx/Rx)           Port1(Tx/Rx)
-------         ----------             -----------
NR              33/9                    33/9
NR,RB           58/0                    58/0
SF              4/0                     4/0
MS              0/0                     0/0
FS              0/0                     0/0
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show erps status

`show erps status [ring <RINGID>] [instance <ID>]`

Description

This command displays detailed information about a specific ring or all instances of a ring.

The ring instance may be in one of the following states:

- **Idle**: The ring instance is operational.
- **Initializing**: The ring instance is not operational.
- **Protection**: Protection switching has been triggered by a local or remote link failure.
- **Pending**: Pending clearance of a previous protection switch.
- **Down**: Ring instance is not active.
- **Manual-switch**: Manual protection switching triggered by Admin-down.
- **Force-switch**: Forced protection switching triggered by admin.

A ring instance has the following reasons for "down" state:

- **Disabled**: Ring instance is administratively disabled.
- **Inconsistent Port Config**: The same port is configured as port0 and port1 or RPL port is configured by Admin-down.
- **Incomplete Port Config**: Only one or no ring port is configured.
- **Protected VLANs Not Configured**: Protected VLAN list is empty.
- **Control VLAN Not Configured**: Control VLAN is not configured.

The ring ports can be in one of the following states:

- **Up**: Port forwards control and data traffic.
- **Blocked**: Port blocks both control and data traffic.

Parameter	Description
<RINGID>	Optional, specifies the ID of the ring. Range: 1-239.
<ID>	Optional, specifies the ID of the ring instance. Range: 1-2.

Examples

Show ERPS status for ring 1 and instance 1:

```
Status for ERPS Ring 1 Instance 1
=================================
Ring ID                         : 1
Ring description                : ring_1
Instance ID                     : 1
Instance description            : inst_1
Port0                           : 1/0/1 (Blocked)
Port1                           : 1/0/2 (Up)
Node Role (RPL)                 : Owner (Port0)
Control VLAN                    : 100
Protected VLAN                  : None
Subring (TCN)                   : Yes (Yes)
Revertive Operation             : Revertive
MEG Level                       : 1
Transmission Interval           : 5 sec
Guard Interval                  : 500 ms
Hold-Off Interval               : 1 sec
WTR Interval                    : 5 min
```

```
Status                         : Initializing
Oper Down Reason               : Protected Vlans Not Configured
```

Show ERPS status for ring 1:

```
switch# show erps status ring 1

Status for ERPS Ring 1 Instance 1
=================================
Ring ID                        : 1
Ring description               : ring_1
Instance ID                    : 1
Instance description           : inst_1
Port0                          : 1/0/1 (Blocked)
Port1                          : 1/0/2 (Up)
Node Role (RPL)                : Owner (Port0)
Control VLAN                   : 100
Protected VLAN                 : 1-10
Subring (TCN)                  : Yes (Yes)
Revertive Operation            : Non-Revertive
MEG Level                      : 1
Transmission Interval          : 5 sec
Guard Interval                 : 500 ms
Hold-Off Interval              : 1 sec
WTR Interval                   : 5 min
Status                         : Idle
Oper Down Reason               : None


Status for ERPS Ring 1 Instance 2
=================================
Ring ID                        : 1
Ring description               : ring_1
Instance ID                    : 2
Instance description           : inst_2
Port0                          : 1/0/3 (Blocked)
Port1                          : 1/0/4 (Up)
Node Role (RPL)                : Owner (Port0)
Control VLAN                   : 110
Protected VLAN                 : 20-30
Subring (TCN)                  : No
Revertive Operation            : Revertive
MEG Level                      : 1
Transmission Interval          : 5 sec
Guard Interval                 : 500 ms
Hold-Off Interval              : 1 sec
WTR Interval                   : 5 min
Status                         : Admin-Down
Oper Down Reason               : None
```

For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show erps summary

```
show erps summary
```

Description

This command displays a summary of the ERPS configuration and state for the ERPS ring instances.

Examples

```
switch# show erps summary

ERPS Summary
============

Flags: R - RPL, M - Major Ring, S - Sub Ring, T - TCN Enabled
       * - RPL port

Per-Instance Summary
====================
Ring  Instance    Port0     Port1       Status         Flags
----  --------    -----     -----       ------         -----
1     1           1/1/1     *1/1/2      Pending        R,M
1     2           1/1/1     1/1/2       Idle           M
2     1           *1/1/3      -         Protection     R,S,T
2     2           1/1/3       -         Admin-down     S,T
3     1           1/1/4     1/1/5       Manual-switch  M
3     2           1/1/4     1/1/5       Force-switch   M
```

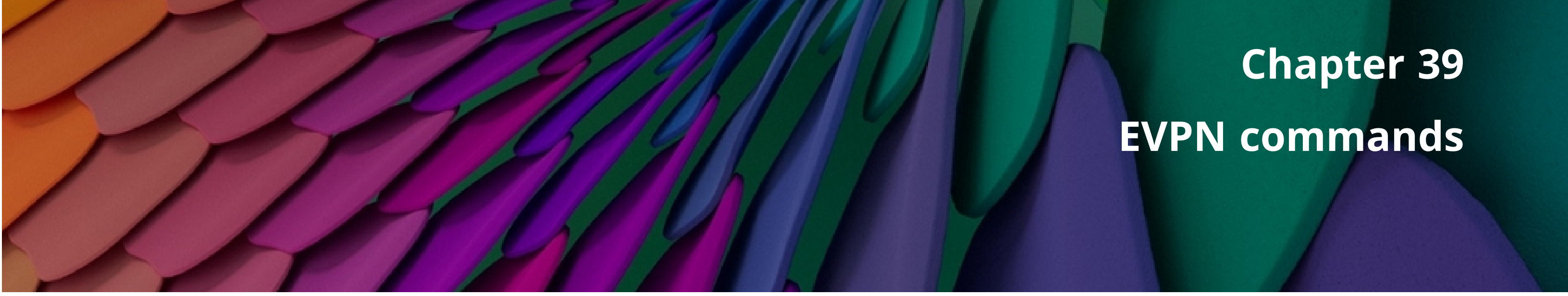
For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 39 EVPN commands

active-gateway

```
active-gateway {ip | ipv6} [<IP-ADDRESS>] [mac <MAC-ADDRESS>]
no active-gateway {ip | ipv6} [<IP-ADDRESS>] [mac]
```

Description

Configures an EVPN Anycast gateway that can be used on multiple VTEPs. The Active Gateway supports both IPv4 and IPv6 addresses. The Active Gateway MAC address used along with an IPv4 and IPv6 address must match on a given interface, for the EVPN Anycast Gateway solution to work as expected. Active Gateway and SVI sharing the same IP is supported for both IPv4 and IPv6 addresses. The Active Gateway IP for IPv6 should be a Link-Local IPv6 address if the default Gateway is learned via RA messages.

The **no** form of this command removes the active gateway for active-active routing.

Parameter	Description
`ip`	Specifies the configuration of an IPv4 address.
`ipv6`	Specifies the configuration of an IPv6 address.
`<IP-ADDRESS>`	Specifies the IPv4 or IPv6 address. ▪ Syntax for IPv4: `A.B.C.D` ▪ Syntax for IPv6: `A:B::C:D`
`<MAC-ADDRESS>`	Specifies the Virtual MAC address. Syntax: `xx:xx:xx:xx:xx:xx`

Usage

Before configuring active gateway, confirm that an IP address is on the SVI that is in the same subnet as the active gateway IP you are trying to configure. If an active gateway IP does not have an SVI IP with the same subnet, the CLI allows the configuration, but the active gateway IP will not be programmed in the kernel, resulting the active gateway to be unreachable.

Active forwarding cannot be configured when ICMP redirect is enabled. Enter the `no ip icmp redirect` command for disabling ICMP redirect.

It is highly recommended that you use an IPv6 link-local address as a gateway (VIP) on the active gateway IPv6 configuration.

If VRRP or active forwarding is configured on an SVI, active gateway cannot be configured. Active gateway with overlapping networks is not allowed. Maximum of 16 unique virtual MACs are supported in a system.

The maximum number of supported active gateways per switch is 4,000. Since a maximum of 31 secondary IPv4 addresses can be configured on an SVI, 32 IPv4 active gateways (along with the primary

IPv4 address) can be configured per SVI with IP multinetting support. This support is also the same for IPv6 addresses.

Do not use peer system MAC address as an active-gateway VMAC. If same MAC address is used, the VSX synchronization will try to sync the configuration on secondary switch and cause traffic disruptions.

Examples

Configuring active-gateway when the IP address is different from the SVI IP address on both VSX peers (valid for IPv4 and IPv6):

Switch 1:

```
switch1(config-if-vlan)# ip address 192.168.1.250/24
switch1(config-if-vlan)# active-gateway ip 192.168.1.253 mac 00:00:00:00:00:01
switch1(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
```

Switch 2:

```
switch2(config-if-vlan)# ip address 192.168.1.251/24
switch2(config-if-vlan)# active-gateway ip 192.168.1.253 mac 00:00:00:00:00:01
switch2(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
```

Configuring active-gateway when the IP address is the same as the SVI IP address on both VSX peers (valid for IPv4 and IPv6):

Switch 1:

```
switch1(config-if-vlan)# ip address 192.168.1.250/24
switch1(config-if-vlan)# active-gateway ip 192.168.1.250 mac 00:00:00:00:00:01
switch1(config-if-vlan)# active-gateway ipv6 fe80::100 mac 00:00:00:00:00:01
switch1(config-if-vlan)# ipv6 address link-local fe80::100/64
```

Switch 2:

```
switch2(config-if-vlan)# ip address 192.168.1.250/24
switch2(config-if-vlan)# active-gateway ip 192.168.1.250 mac 00:00:00:00:00:01
switch2(config-if-vlan)# active-gateway ipv6 fe80::100 mac 00:00:00:00:00:01
switch2(config-if-vlan)# ipv6 address link-local fe80::100/64
```

Configuring only the active gateway address:

```
switch(config-if-vlan)# ip address 192.168.1.250/24
switch(config-if-vlan)# active-gateway ip 192.168.1.250
```

Configuring only the active gateway IP MAC address:

```
switch2(config-if-vlan)# ip address 192.168.1.250/24
switch2(config-if-vlan)# active-gateway ip mac 00:00:00:01:00:01
```

Removing the active gateway for active-active routing (IPv6 and IPv4):

```
switch(config-if-vlan)# no active-gateway ip
switch(config-if-vlan)# no active-gateway ipv6
```

Removing the active gateway for active-active routing for an IP address:

```
switch(config-if-vlan)# no active-gateway ip 192.168.1.250
```

Removing the active gateway for active-active routing for virtual MAC addresses:

```
switch(config-if-vlan)# no active-gateway ip mac
```

When configuring the virtual active gateway for IPv6 on an SVI, it is recommended to use the same global IPv6 and active gateway IPv6 address. Similarly, if you want to use the IPv6 link-local address for the virtual active gateway then the same address should be configured for both the SVI and the active gateway.

Global IPv6 address:

```
switch(config-if-vlan)# ipv6 address 1001::1/64
switch(config-if-vlan)# active-gateway ipv6 1001::1
switch(config-if-vlan)# active-gateway ipv6 mac 00:00:00:00:aa:01
```

IPv6-Link-Local address:

```
switch(config-if-vlan)# ipv6 address link-local fe80::1/64
switch(config-if-vlan)# active-gateway ipv6 fe80::1
switch(config-if-vlan)# active-gateway ipv6 mac 00:00:00:00:aa:01
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.09.0010	Added IPv6 support for configuration of active gateway and SVI with the same IP address.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

arp-suppression

`arp-suppression`

```
no arp-suppression
```

Description

Enables ARP suppression for EVPN VXLAN globally across all Layer 2 VNIs configured on the VTEP. If the target address is present in the neighbor cache, the switch responds to the broadcast or unicast ARP request. ARP suppression is disabled by default. If the target IP/MAC is not present, the switch forwards arp request over the VXLAN data plane for neighbor resolution.

The **no** form of this command disables the ARP suppression.

Examples

Configuring ARP suppression in EVPN:

```
switch(config-evpn)# arp-suppression
switch(config-evpn)# no arp-suppression
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn` `config-evpn-vlan`	Administrators or local user group members with execution rights for this command.

disable (evpn vlan-aware-bundles)

```
disable
```

Description

Disables the VLAN aware bundle instance.

Examples

Disabling the VLAN aware bundle instance bundle_1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# disable
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

enable(evpn vlan-aware-bundles)

```
enable
```

Description

Enables the VLAN aware bundle instance.

Examples

Enabling the VLAN aware bundle instance bundle_1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# enable
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

evpn

```
evpn
no evpn
```

Description

Specifies the EVPN context which provides the configurations for VLAN-based EVPN service mode.

The **no** form of this command removes this configuration.

Examples

Configuring the EVPN context:

```
switch(config)# evpn
switch(config-evpn)#
```

Removing the EVPN configuration context:

```
switch(config-evpn)# no evpn
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn`	Administrators or local user group members with execution rights for this command.

mac-move-detection count timer

```
mac-move-detection count <MAC-MOVE-COUNT> timer <MAC-MOVE-TIMER>
no mac-move-detection count <MAC-MOVE-COUNT> timer <MAC-MOVE-TIMER>
```

Description

Configures EVPN MAC dampening for duplicate MAC and MAC-move count and timer across VTEPs.

The **no** form of this command resets the value of the count and timer to the default values of `5` and `180` seconds respectively.

EVPN MAC dampening is always enabled. Links to the VTEPs must be always up for EVPN MAC dampening to be activated.

Parameter	Description
`count <MAC-MOVE-COUNT>`	Specifies the number of MAC-moves for MAC dampening to take effect. Range: 2 to 10. Default: 5.
`timer <MAC-MOVE-TIMER>`	Specifies the MAC-move time limit in seconds for MAC dampening to take effect. Range: 1 to 1000 seconds. Default: 180 seconds.

Examples

Configuring EVPN MAC dampening:

```
switch(config-evpn)# mac-move-detection count 6 timer 199
```

The above command dampens a MAC if the MAC moves six times within 199 seconds.

```
switch(config-evpn)# mac-move-detection count 8
```

The above command dampens a MAC if the MAC moves eight times within 180 seconds.

```
switch(config-evpn)# mac-move-detection timer 255
```

The above command dampens a MAC if the MAC moves five times within 255 seconds.

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn`	Administrators or local user group members with execution rights for this command.

nd-suppression

```
nd-suppression
no nd-suppression
```

Description

Enables ND suppression for EVPN VXLAN globally. If the target address is present in the NDMD cache, the switch responds to the IPv6 multicast or unicast neighbor solicitation. ND suppression is disabled by default.

The **no** form of this command disables the ND suppression.

Examples

Configuring ND suppression in EVPN:

```
switch(config-evpn)# nd-suppression
switch(config-evpn)# no nd-suppression
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn`	Administrators or local user group members with execution rights for this command.

rd

```
rd {auto | <AS-NUMBER:ID> | <IP-ADDRESS:ID>}
no rd {auto | <AS-NUMBER:ID> | <IP-ADDRESS:ID>}
```

Description

Specifies a unique number prepended to the advertised routes within the VLAN. It ensures support for overlapping IP addresses and MACs across different tenants. The default value is NULL. Route Distinguisher (RD) has to be manually configured by a user.

The **no** form of this command removes the currently configured value.

Parameter	Description
`auto`	Specifies automatic route filtering.
<AS-NUMBER:ID>	Specifies the AS number. It can be a 1-byte or 4-byte value. If the AS number is a 2-byte value, the administrative number is a 4-byte value and if the AS number is 4-byte value, the administrative number is a 2-byte value.
<IP-ADDRESS:ID>	Specifies the IP address. It is a 4-byte value and the ID is 2 bytes.

Examples

Configuring Route Distinguisher for EVPN VLAN:

```
switch(config-evpn)# vlan 10
switch(config-evpn-vlan-10)# rd 6800:1
switch(config-evpn)# vlan 20
switch(config-evpn-vlan-20)# rd auto
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan`	Administrators or local user group members with execution rights for this command.

rd (evpn vlan-aware-bundles)

```
rd {<AS-NUMBER:NN> | <IP-ADDRESS:NN>}
no rd {<AS-NUMBER:NN> | <IP-ADDRESS:NN>}
```

Description

Specifies a unique number prepended to the EVPN routes, advertised in the context of any VLAN configured under an EVPN VLAN aware bundle instance.

The **no** form of this command removes this configuration.

Parameter	Description
<AS-NUMBER:NN>	Specifies the AS number. The AS number can be a 2-byte or 4-byte value. If the AS number is a 2-byte value, the administrative number is a 4-byte value and if the AS number is 4-byte value, the administrative number is a 2-byte value.
<IP-ADDRESS:NN>	Specifies the IP address. The IP address is a 4-byte value and the ID is a 2--byte value.

Usage

This command ensures the support for overlapping IPs and MACs across different tenants. `rd` should be manually configured. `rd` should be unique acorss all VLAN-based (VLANs) and VLAN-aware (bundles) service instances.

Examples

Configuring rd 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# rd 6800:1
```

Removing rd 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no rd 6800:1
```

Configuring rd 1.2.3.4:55.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# rd 1.2.3.4:55
```

Removing rd 1.2.3.4:55.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no rd 1.2.3.4:55
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

redistribute host-route

```
redistribute host-route
no redistribute host-route
```

Description

Enables type-2 route advertisement to include the L3VNI, RT, and router MAC of the associated IP-VRF. It is applicable only in Symmetric routing where L3VNI is configured.

The **no** form of this command disables the redistribution of host routes.

Parameter	Description
`host-route`	Specifies redistribution of host routes.

Examples

Configuring Redistribute host-route in EVPN:

```
switch(config-evpn)# vlan 10
switch(config-evpn-vlan-10)# redistribute host-route
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan`	Administrators or local user group members with execution rights for this command.

redistribute host-route (evpn vlan-aware-bundles)

```
redistribute host-route
no redistribute host-route
```

Description

Enables EVPN Route Type-2 advertisement to include L3VNI, Route Target, and Router MAC of the associated IP-VRF in the EVPN VLAN Aware Bundles.

The **no** form of this command removes this configuration.

Usage

This is only applicable in cases of symmetric routing where L3VNI is configured.

Examples

Enabling route advertisement in VLAN aware bundle bundle_1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# redistribute host-route
```

Removing the route advertisement in VLAN aware bundle bundle_1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no redistribute host-route
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

redistribute local-mac

```
redistribute local-mac
no redistribute local-mac
```

Description

Enables Type-2 route advertisement for local MAC address of the SVI interfaces corresponding to the EVPN-enabled VLANs.

The **no** form of this command disables the Type-2 route advertisement.

Examples

```
switch(config)# evpn
switch(config)# redistribute local-mac
switch(config)# vlan 20
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-evpn`	Administrators or local user group members with execution rights for this command.

redistribute local-svi

```
redistribute local-svi
no redistribute local-svi
```

Description

Enables type-2 route advertisement for the local IP address and MAC address of the SVI interfaces corresponding to the EVPN-enabled VLANs.

The **no** form of this command disables type-2 route advertisement for the local IP address and MAC address of the SVI interfaces corresponding to the EVPN-enabled VLANs.

Examples

Enabling type-2 route advertisement:

```
switch(config)# evpn
switch(config-evpn)# redistribute local-svi
```

Disabling type-2 route advertisement:

```
switch(config)# evpn
switch(config-evpn)# no redistribute local-svi
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn`	Administrators or local user group members with execution rights for this command.

route-target

```
route-target {import | export | both} {auto | <AS-NUMBER:ID> | <IP-ADDRESS:ID>}
no route-target {import | export | both} {auto | <AS-NUMBER:ID> | <IP-ADDRESS:ID>}
```

Description

Controls the import and export of VPN routes only to the systems in the network for which routes are needed. The default value is NULL. Route Targets (RT) have to be manually configured by a user.

The **no** form of this command removes the currently configured value.

Parameter	Description
`import`	Configures the route-target to import EVPN routes.
`export`	Configures the route-target to export EVPN routes.
`both`	Configures the route-target to import and export EVPN routes.
`auto`	Specifies automatic route filtering.
<AS-NUMBER:ID>	Specifies the AS number. It can be a 1-byte or 4-byte value. If the AS number is a 2-byte value, the administrative number is a 4-byte value and if the AS number is 4-byte value, the administrative number is a 2-byte value.

Parameter	Description
<IP-ADDRESS:ID>	Specifies the IP address. It is a 4-byte value and the ID is 2 bytes.

Examples

Configuring Route Targets for EVPN VLAN:

```
switch(config-evpn)# vlan 10
switch(config-evpn-vlan-10)# route-target import 6800:1
switch(config-evpn-vlan-10)# route-target export 6800:1
switch(config-evpn)# vlan 20
switch(config-evpn-vlan-20)# route-target both 6900:1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-evpn-vlan	Administrators or local user group members with execution rights for this command.

route-target {evpn}

```
route-target {import | export | both} {auto | <AS-NUMBER:ID> | <IP-ADDRESS:ID>} evpn
no route-target {import | export | both} {auto | <AS-NUMBER:ID> | <IP-ADDRESS:ID>} evpn
```

Description

Configures the route target (RT) for EVPN VRF to control the import and export of VPN routes only to the systems in the network for which routes are needed. The default value is NULL. Route targets have to be manually configured by a user.

The **no** form of this command removes the RT in EVPN VRF.

Parameter	Description
import	Imports the VRF routes that match the RT.
export	Exports the RT in the VRF routes.
both	Configures both import and export of routes for the VRF.
auto	Specifies automatic route filtering.

Parameter	Description
<AS-NUMBER:ID>	Specifies the AS number. It can be a 1-byte or 4-byte value. If the AS number is a 2-byte value, the administrative number is a 4-byte value and if the AS number is 4-byte value, the administrative number is a 2-byte value.
<IP-ADDRESS:ID>	Specifies the IP address. It is a 4-byte value and the ID is 2 bytes.

Examples

Configuring Route Targets for EVPN VRF:

```
switch(config-vrf)# route-target import 6800:1 evpn
switch(config-vrf)# route-target export 6800:1 evpn
switch(config-vrf)# route-target both 6800:1 evpn
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-vrf	Administrators or local user group members with execution rights for this command.

route-target (evpn vlan-aware-bundles)

```
route-target {import | export | both} {<AS-NUMBER:ID> | <IP-ADDRESS:ID>}
no route-target {import | export | both} {<AS-NUMBER:ID> | <IP-ADDRESS:ID>}
```

Description

Enables the import and export of EVPN routes only to the systems in the network for which routes are needed.

The **no** form of this command removes this configuration.

Parameter	Description
import	Configures the route-target to import EVPN routes.
export	Configures the route-target to export EVPN routes.
both	Configures the route-target to import and export EVPN routes.

Parameter	Description
<AS-NUMBER:ID>	Specifies the AS number. It can be a 2-byte or 4-byte value. If the AS number is a 2-byte value, the administrative number is a 4-byte value and if the AS number is 4-byte value, the administrative number is a 2-byte value.
<IP-ADDRESS:ID>	Specifies the IP address. It is a 4-byte value and the ID is 2 bytes.

Usage

Route targets should be unique across all VLAN-based (VLANs) and VLAN-aware (bundles) service instances. `rt` should be manually configured.

Examples

Configuring the import of route target 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# route-target import 6800:1
```

Removing the import of route target 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no route-target import 6800:1
```

Configuring the export of route target 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# route-target export 6800:1
```

Removing the export of route target 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no route-target export 6800:1
```

Configuring the import and export of route target 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# route-target both 6800:1
```

Removing the import and export of route target 6800:1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no route-target both 6800:1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

show evpn evi

`show evpn evi`

Description

Shows the information of EVPN instances.

Examples

Showing information for EVPN instances:

```
switch# show evpn evi

L2VNI : 100
    Route Distinguisher        : 10.10.10.1:10
    VLAN                       : 10
    Status                     : Up
    RT Import                  : 1.1.1.1:1, 2.2.2.2:1, 3.3.3.3:1, 5:1
    RT Export                  : 4.4.4.4:61, 1000:21
    Local MACs                 : 30
    Remote MACs                : 945
    Peer VTEPs                 : 8

L2VNI : 200
    Route Distinguisher        :
    VLAN                       : 20
    Status                     : Down, No RD
    RT Import                  : 1.1.1.1:2, 2.2.2.2:2, 3.3.3.3:2, 4.4.4.4:2,
                                 5.5.5.5:2, 5:2
    RT Export                  : 4.4.4.4:62, 1000:22
    Local MACs                 :
    Remote MACs                :
    Peer VTEPs                 :

L2VNI : 300
    Route Distinguisher        : 10.10.10.1:30
    VLAN                       : 30
    Status                     : Up
    RT Import                  : 1.1.1.1:3, 2.2.2.2:3, 3.3.3.3:3, 5:3
    RT Export                  : 4.4.4.4:63, 1000:23
    Local MACs                 : 30
    Remote MACs                : 945
    Peer VTEPs                 : 12

L3VNI : 1000
    Route Distinguisher        : 10.10.10.1:1000
    VRF                        : vrf1000
    Status                     : Up
    RT Import                  : 1.1.1.1:4, 2.2.2.2:4, 3.3.3.3:4, 5:4
    RT Export                  : 4.4.4.4:64, 1000:24
    Local Type-5 Routes        : 2
    Remote Type-5 Routes       : 3
    Peer VTEPs                 : 6
```

```
switch# show evpn evi 1001001
L2VNI : 1001001
Route Distinguisher        : 192.168.1.1:1001
VLAN                       : 1001
Status                     : up
RT Import                  : 65001:269436457
RT Export                  : 65001:269436457
Local MACs                 : 1
Remote MACs                : 0
Peer VTEPs                 : 4
```

```
switch# show evpn mac-ip evi 1001001
Flags:  Local(L), Remote(R), Sticky bit(S)
MAC                  IP                Next-hop       Seq-Num   Flags
-----------------------------------------------------------------------
00:50:56:8d:44:13                           0         L
00:50:56:8d:44:13    100.1.250.50           0         L
00:50:56:8d:44:13    1000:1:1:1::250:50
0         L
00:aa:bb:cc:11:01    100.1.1.1              1         L,S
00:aa:bb:cc:11:01    1000:1:1:1::1          1         L,S
00:aa:bb:cc:11:01    fe80:0:1::1            1         L,S
```

```
switch# show evpn mac-ip evi 1001001
Flags:  Local(L), Remote(R), Sticky bit(S)
MAC                  IP                Next-hop       Seq-Num   Flags
-----------------------------------------------------------------------
00:50:56:8d:44:13                           0         L
00:50:56:8d:44:13    100.1.250.50           0         L
00:50:56:8d:44:13    1000:1:1:1::250:50
0         L
00:aa:bb:cc:11:01    100.1.1.1              1         L,S
00:aa:bb:cc:11:01    1000:1:1:1::1          1         L,S
00:aa:bb:cc:11:01    fe80:0:1::1            1         L,S
MACs           : 2
Remote MACs    : 0

switch# show evpn mac-ip evi 1001002
Flags:  Local(L), Remote(R), Sticky bit(S)
MAC                  IP                 Next-hop                     Seq-Num
Flags
----------------------------------------------------------------------------------
------------
00:50:56:8d:45:63                        vxlan1(1920:1680:1:1::2)     0         R
00:50:56:8d:45:63    100.2.250.60        vxlan1(1920:1680:1:1::2)     0         R
00:50:56:8d:45:63    1000:2:1:1::250:60  vxlan1(1920:1680:1:1::2)     0         R
00:aa:bb:cc:11:01    100.2.1.1                                        0
L,S
00:aa:bb:cc:11:01    1000:2:1:1::1                                    0
L,S
```

```
00:aa:bb:cc:11:01    fe80:0:2::1                                      0
L,S
MACs           : 2
Remote MACs    : 1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show evpn evi summary

```
show evpn evi summary
```

Description

Shows the summary information for EVPN instances.

Examples

Showing summary information for EVPN instances:

```
switch# show evpn evi summary

    L2VNI    VLAN                Status
    -------------------------------------
    100      10                  Up
    200      20                  Down, RT conflict
    210      21                  Up
    220      22                  Down, No RT
    230      23                  Down, No RT
    240      24                  Up
    250      25                  Up
    260      26                  Up
    270      27                  Up
    280      28                  Up
    290      29                  Up
    310      31                  Up

    L3VNI    VRF                 Status
    -------------------------------------
    1000     vrf1000             Up
    1001     vrf1001             Down, RT conflict
    1002     vrf1002             Down, No RD
    1004     vrf1003              Down, Administratively down
    1005     vrf1003              Up

    EVPN instances     : 17
    EVPN instances Up  : 11
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show evpn evi *<EVI-ID>*

`show evpn evi <EVI-ID>`

Description

Shows the information for the particular EVPN instance.

Parameter	Description
<EVI-ID>	Specifies the EVPN instance ID.

Examples

Showing information for the particular EVPN instance:

```
switch# show evpn evi 100
L2VNI : 100
    Route Distinguisher         : 10.10.10.1:10
    VLAN                        : 10
    Status                      : Up
    RT Import                   : 1.1.1.1:1, 2.2.2.2:1, 3.3.3.3:1, 5:1
    RT Export                   : 4.4.4.4:61, 1000:21
    Local MACs                  : 30
    Remote MACs                 : 945
    Peer VTEPs                  : 8
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show evpn evi detail

```
show evpn evi detail
```

Description

Shows the detailed information for all EVPN instances.

Examples

Showing detailed information for EVPN instances:

```
switch# show evpn evi detail

L2VNI : 100
    Route Distinguisher        : 10.10.10.1:10
    VLAN                       : 10
    Status                     : Up
    RT Import                  : 1.1.1.1:1, 2.2.2.2:1, 3.3.3.3:1, 5:1
    RT Export                  : 4.4.4.4:61, 1000:21
    Local MACs                 : 30
    Remote MACs                : 307
    Peer VTEPs                 : 8

    Peer VTEPs                                 Remote MACs
    -------------------------------------------------------
    10.10.10.2                                 40
    10.10.10.3                                 22
    10.10.10.4                                 15
    10.10.10.5                                 155
    10.10.10.6                                 25
    10.10.10.7                                 35
    10.10.10.8                                 50
    10.10.10.9                                 55

L2VNI : 200
    Route Distinguisher        :
    VLAN                       : 20
    Status                     : Down, No RD
    RT Import                  : 1.1.1.1:2, 2.2.2.2:2, 3.3.3.3:2, 4.4.4.4:2,
                                 5.5.5.5:2, 5:2
    RT Export                  : 4.4.4.4:62, 1000:22
    Local MACs                 :
    Remote MACs                :
    Peer VTEPs                 :
```

```
    Peer VTEPs                                  Remote MACs
    -------------------------------------------------------

L2VNI : 300
    Route Distinguisher         : 10.10.10.1:30
    VLAN                        : 30
    Status                      : Up
    RT Import                   : 1.1.1.1:3, 2.2.2.2:3, 3.3.3.3:3, 5:3
    RT Export                   : 4.4.4.4:63, 1000:23
    Local MACs                  : 30
    Remote MACs                 : 362
    Peer VTEPs                  : 12

    Peer VTEPs                                 Remote MACs
    ------------------------------------------------------
    10.10.10.2                                 60
    10.10.10.3                                 12
    10.10.10.4                                 13
    10.10.10.5                                 15
    10.10.10.6                                 15
    10.10.10.7                                 35
    10.10.10.8                                 53
    10.10.10.9                                 45
    10.10.10.10                                11
    10.10.10.11                                12
    10.10.10.12                                35
    10.10.10.13                                56

L3VNI : 1000
    Route Distinguisher        : 10.10.10.1:1000
    VRF                        : vrf1000
    Status                     : Up
    RT Import                  : 1.1.1.1:4, 2.2.2.2:4, 3.3.3.3:4, 5:4
    RT Export                  : 4.4.4.4:64, 1000:24
    Local Type-5 Routes        : 2
    Remote Type-5 Routes       : 30
    Peer VTEPs                 : 12

    Peer VTEPs                        Remote Type-5 Routes
    ------------------------------------------------------
    10.10.10.2                        2
    10.10.10.3                        1
    10.10.10.4                        1
    10.10.10.5                        1
    10.10.10.6                        1
    10.10.10.7                        3
    10.10.10.8                        5
    10.10.10.9                        4
    10.10.10.10                       1
    10.10.10.11                       3
    10.10.10.12                       3
    10.10.10.13                       5
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show evpn evi *<EVI-ID>* detail

```
show evpn evi <EVI-ID> detail
```

Description

Shows the detailed information for the particular EVPN instance.

Parameter	Description
<EVI-ID>	Specifies the EVPN instance ID.

Examples

Showing detailed information for the particular EVPN instance:

```
switch# show evpn evi 100 detail
L2VNI : 100
    Route Distinguisher        : 10.10.10.1:10
    VLAN                       : 10
    Status                     : Up
    RT Import                  : 1.1.1.1:1, 2.2.2.2:1, 3.3.3.3:1, 5:1
    RT Export                  : 4.4.4.4:61, 1000:21
    Local MACs                 : 30
    Remote MACs                : 397
    Peer VTEPs                 : 8

    Peer VTEPs                                 Remote MACs
    ------------------------------------------------------
    10.10.10.2                                 40
    10.10.10.3                                 22
    10.10.10.4                                 15
    10.10.10.5                                 155
    10.10.10.6                                 25
    10.10.10.7                                 35
    10.10.10.8                                 50
    10.10.10.9                                 55
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show evpn mac-ip

```
show evpn mac-ip
```

Description

Show the information about the EVPN MAC-IP for the EVPN instances.

Examples

Showing information about the EVPN MAC-IP for the EVPN instances:

```
switch# show evpn mac-ip
Flags:  Local(L), Remote(R)

EVI    MAC                  IP         Next-hop            Seq-Num   Flags
--------------------------------------------------------------------------
100    14:50:56:96:76:56               vxlan1(11.1.1.3)    0         R
100    14:50:56:96:76:56    3.3.4.5    vxlan1(11.1.1.3)    0         R
100    14:50:56:96:76:56    3.3.5.5    vxlan1(11.1.1.3)    0         R
100    24:50:56:96:76:56    3.3.3.2    vxlan1(11.1.1.3)    1         R
100    34:50:56:96:76:56    3.3.6.2                        2         L
100    44:50:56:96:76:56    3.3.7.3                        2         L
200    52:50:56:96:76:56    5.5.5.2                        0         L

MACs        : 5
Remote MACs : 2
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show evpn mac-ip evi

`show evpn mac-ip evi <EVI-ID>`

Description

Show the information about the EVPN MAC-IP for the particular EVPN instance.

Parameter	Description
<EVI-ID>	Specifies the EVPN instance ID.

Examples

Showing information about the EVPN MAC-IP for the particular EVPN instance:

```
switch# show evpn mac-ip evi 100
Flags:  Local(L), Remote(R)

MAC                  IP         Next-hop            Seq-Num  Flags
------------------------------------------------------------------
14:50:56:96:76:56               vxlan1(11.1.1.2)    0        R
14:50:56:96:76:56    3.3.4.5    vxlan1(11.1.1.3)    0        R
14:50:56:96:76:56    3.3.5.4    vxlan1(11.1.1.2)    0        R
24:50:56:96:76:56    3.3.3.2    vxlan1(11.1.1.3)    1        R
34:50:56:96:76:56    3.3.6.2                        2        L
44:50:56:96:76:56    3.3.7.3                        2        L

MACs        : 4
Remote MACs : 2
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show evpn vtep-neighbor

`show evpn vtep-neighbor {all-vrfs | vrf <VRF-Name>}`

Description

Shows the remote VTEPs MAC-IP binding. The state of the peer VTEP denotes whether VXLAN tunnel to the VTEP is Up or Down.

Parameter	Description
`all-vrfs`	Display information for all VRFs.
`vrf <vrf-name>`	Specify a VRF by VRF name (if no *<VRF-NAME>* is specified, the default VRF is implied.

Examples

Showing EVPN VTEP neighbor information for all VRFs:

```
switch# show evpn vtep-neighbor all-vrfs
VTEP-IP           L3VNI  MAC                  VRF      State
-------------------------------------------------------------------
2.2.2.2           1234   00:20:56:bd:27:bc  VRF1234  Up
2.2.2.2           6789   00:20:56:bd:27:bc  VRF6789  Up
3.3.3.3           1234   00:30:56:ef:aa:cc  VRF1234  Down
4.4.4.4           6789   00:40:56:12:34:44  VRF6789  Up
5.5.5.5           6789   00:50:56:ab:11:ee  VRF6789  Up
```

Showing EVPN VTEP neighbor information for the specified VRF name:

```
switch# show evpn vtep-neighbor vrf VRF1234
VTEP-IP           L3VNI  MAC                  VRF      State
------------------------------------------------------------------
2.2.2.2           1234   00:20:56:bd:27:bc  VRF1234  Up
3.3.3.3           1234   00:30:56:ef:aa:cc  VRF1234  Down
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config evpn

```
show running-config evpn
```

Description

Shows all EVPN configurations.

Examples

Showing all EVPN configurations:

```
switch# show running-config evpn
evpn
    vlan 10
        rd 6800:1
        route-target import 6800:1
        route-target export 6800:1
    vlan 20
        rd 6900:1
        route-target import 6900:1
        route-target export 6900:1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

virtual-mac

```
virtual-mac <MAC-ADDR>
no virtual-mac <MAC-ADDR>
```

Description

Configures the virtual MAC address for EVPN.

The **no** form of this command removes the virtual MAC address configuration.

Parameter	Description
<MAC-ADDR>	Specifies the virtual MAC address.

Examples

Configuring virtual MAC address for EVPN:

```
switch(config)# virtual-mac ab:12:33:33:03:22
```

Removing the configuration of the virtual MAC address for EVPN:

```
switch(config)# no virtual-mac ab:12:33:33:03:22
```

For EVPN symmetric IRB to work, `virtual-mac` must be configured and it must be unique for all the VTEPs involved in EVPN except for VSX nodes. In case of VSX VTEP (logical VTEP), the same `virtual-mac` must be configured in both the VSX peers. For ease of troubleshooting, it is also recommended to configure the same value of VSX `system MAC` in VSX VTEP (logical VTEP) peers.

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

vlan

```
vlan <ID>
no vlan <ID>
```

Description

Specifies the VLAN ID and enters the VLAN context under EVPN.

The **no** form of this command removes this configuration.

Parameter	Description
<ID>	Specifies the VLAN ID. Range: 2 - 4040.

Examples

```
switch(config-evpn)# vlan 10
switch(config-evpn-vlan-10)#
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan`	Administrators or local user group members with execution rights for this command.

vlan-aware-bundle

```
vlan-aware-bundle<BUNDLE-NAME>
no vlan-aware-bundle<BUNDLE-NAME>
```

Description

Creates the VLAN aware bundle instance and enters the VLAN Aware Bundle context.

The **no** form of this command removes this configuration.

Parameter	Description
<BUNDLE-NAME>	Represents the VLAN Aware Bundle.

Usage

VLAN aware bundle and VLAN based service can coexist, but the same VLAN/VNI cannot be part of the VLAN aware bundle and VLAN based service. The VLAN/VNI part of the VLAN aware bundle should be part of the VLAN aware bundle on all vteps.

Examples

Creating the VLAN aware bundle instance bundle_1 and entering the VLAN Aware Bundle context.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)#
```

Removing the VLAN aware bundle instance bundle_1 and exiting the VLAN Aware Bundle context.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no vlan-aware-bundle bundle_1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

vlan-ethernet-tag (evpn vlan-aware-bundles)

```
vlan-ethernet-tag <VLAN-ID> {ethernet tag}
no vlan-ethernet-tag <VLAN-ID> {ethernet tag}
```

Description

Associates the Ethernet Tag ID value to VLANs of the VLAN aware bundles.

The **no** form of this command removes this configuration.

Parameter	Description
<VLAN-ID>	Specifies the VLAN to which the ethernet tag is configuring. Range: 1-4094.
`{ethernet tag}`	Specifies the non-default ethernet tag for the VLAN. Range: 1-16777215.

Usage

The Ethernet Tag ID value should be unique and associated to only one VLAN of the VLAN aware bundle. The configuration of this command is not mandatory, but may be required for interoperability with some third-party vendors.

Examples

Associating the Ethernet tag ID value for vlan aware bundle bundle_1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# vlan-ethernet-tag 10 20
```

Removing the Ethernet tag ID value for vlan aware bundle bundle_1.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no vlan-ethernet-tag 10 20
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

vlan <ID-RANGE>

```
vlan <ID-RANGE>
no vlan <ID-RANGE>
```

Description

Specifies the list of VLANs that are part of the VLAN Aware Bundle.

The **no** form of this command removes this configuration.

Parameter	Description
<ID-RANGE>	Specifies the VLANS that are part of the bundle. Range: 1-4094.

Usage

If a VLAN is already part of VLAN based service, it cannot be configured under `vlan-aware-bundle` service and vice versa.

A VLAN cannot be part of more than one EVPN VLAN aware bundles.

Examples

Creating the VLAN aware bundle instance bundle_1 and entering the VLAN Aware Bundle context for vlan 5-10 and 15.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# vlan 5-10, 15
```

Removing the VLAN aware bundle instance bundle_1and exiting the VLAN Aware Bundle context for vlan 5-10 and 15.

```
switch(config-evpn)# vlan-aware-bundle bundle_1
switch(config-evpn-vlan-aware-bundle-bundle_1)# no vlan 5-10, 15
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-evpn-vlan-aware-bundle`	Administrators or local user group members with execution rights for this command.

Chapter 40

External storage commands

address

```
address {<IPV4-ADDR> | <IPV6-ADDR> | hostname <HOSTNAME>}
no address {<IPV4-ADDR> | <IPV6-ADDR> | hostname <HOSTNAME>}
```

Description

Specifies the NAS IP address or hostname.

The **no** form of this command deletes an IP address or hostname.

Parameter	Description
<IPV4-ADDR>	Specifies the NAS server IPv4 address, Global.
<IPV6-ADDR>	Specifies the IPv6 address of the NAS server.
<HOSTNAME>	Specifies the hostname of the NAS server. String.

Examples

Creating the logfiles storage volume with IP address 10.1.1.1:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# address 10.1.1.1
```

Deleting an external storage volume named logfiles:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no address 10.1.1.1
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-external-storage-<VOLUME-NAME>`	Administrators or local user group members with execution rights for this command.

directory

```
directory <DIRECTORY-NAME>
no directory <DIRECTORY-NAME>
```

Description

Selects an existing directory on the external storage volume.

The **no** form of this command clears a directory of an external storage volume.

Parameter	Description
<DIRECTORY-NAME>	Specifies the external storage directory for mapping the volume.

Examples

Creating a volume named logfiles that is mapped under /home on the server:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# directory /home
```

Clearing the directory /home:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no directory /home
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-external-storage-<VOLUME-NAME>`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

disable

```
disable
no disable
```

Description

Disables the external storage volume.

The **no** form of this command enables the external storage volume. This is identical to the `enable` command.

Examples

Disabling a volume named logfiles:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# disable
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-external-storage-<VOLUME-NAME>`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

enable

```
enable
no enable
```

Description

Enables the external storage volume.

The **no** form of this command disables the external storage volume. This is identical to the `disable` command.

Examples

Creating and then enabling a volume named logfiles:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# enable
```

Disables the external storage volume:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# disable
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-external-storage-<VOLUME-NAME>`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

external-storage

```
external-storage <VOLUME-NAME>
no external-storage <VOLUME-NAME>
```

Description

Creates or updates an external storage volume.

The **no** form of this command deletes an external storage volume.

Examples

Creating the logfiles storage volume:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)#
```

Deleting the logfiles storage volume:

```
switch(config)# no external-storage logfiles
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

password (external-storage)

```
password [{plaintext | ciphertext} <PASSWORD>]
no password {plaintext | ciphertext} <PASSWORD>
```

Description

Sets the password for network attached storage server login.

The **no** form of this command clears the password for network attached storage server login.

Parameter	Description
`{ciphertext	plaintext}`	Selects the password format.
<PASSWORD>	Specifies the password. **NOTE:** When the password is not provided on the command line, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

Examples

Creating a volume named logfiles with password Xj#9:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# password plaintext Xj#9
```

Creating a volume named bak1 with a prompted plaintext password:

```
switch(config)# external-storage bak1
switch(config-external-storage-bak1)# password
Enter the NAS server password: **********
Re-Enter the NAS server password: **********
```

Clearing the password for volume logfiles:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no password plaintext Xj#9
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-external-storage-<VOLUME-NAME>`	Administrators or local user group members with execution rights for this command.

show external-storage

```
show external-storage [<VOLUME-NAME>]
```

Description

Shows external storage configuration and state for all volumes or for a specified volume.

Parameter	Description
<VOLUME-NAME>	Specifies the external storage volume name that the show command will use.

Examples

```
switch# show external-storage

-----------------------------------------------------------------------------------
--
           Address      VRF      Username      Type        Directory     State
-----------------------------------------------------------------------------------
--
nfsvol     10.1.1.1     nas      ---           NFSv3       /home
operational
nfsfiles   20.1.1.1     nas      netstorage    NFSv4       /netstor      disabled
scpdev     nasserver    nas      scpstor       SCP         /scp
unaccessible
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config external-storage

```
show running-config external-storage
```

Description

Shows the running configuration of the external storage.

Examples

```
switch# show running-config external-storage

external-storage nfsvol
      address   10.1.1.1
      vrf       nas
      type      nfsv4
      directoty /home
      enable
external-storage scpdev
      address   30.1.1.1
      vrf       nas
      username  switchuser
      password  ciphertext xxx
      type      scp
      directoty /home
      enable
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

type

```
type {nfsv3 | nfsv4 | scp}
no type {nfsv3 | nfsv4 | scp}
```

Description

Sets the network attached storage access type for reaching the external storage volume.

The **no** form of this command deletes an external storage volume.

Parameter	Description
`nfsv3`	Specifies the NFSv3 network access protocol.
`nfsv4`	Specifies the NFSv4 network access protocol.
`scp`	Specifies the SCP network access protocol.

Examples

Creating the logfiles volume using NFSV4:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# type nfsv4
```

Clearing the external storage access type:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no type nfsv4
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-external-storage-<VOLUME-NAME>`	Administrators or local user group members with execution rights for this command.

username

```
username <USER-NAME>
no username <USER-NAME>
```

Description

Sets the username for logging in to a network attached storage server.

The **no** form of this command clears a username.

Parameter	Description
<USER-NAME>	Specifies the username.

Examples

Creating a volume named logfiles with the user name nassuser:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# username nasuser
```

Clearing the user name nasuser from accessing the logfiles volume:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no username nasuser
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage-*<VOLUME-NAME>*	Administrators or local user group members with execution rights for this command.

vrf

```
vrf <VRF-NAME>
no vrf <VRF-NAME>
```

Description

Setting a VRF to reach network attached storage.

The **no** form of this command clears access of a VRF to network attached storage.

Parameter	Description
<VRF-NAME>	Specifies the VRF name.

Examples

Creating the logfiles volume and setting a VRF named nas to access the network attached storage:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# vrf nas
```

Clearing access of a VRF named nas to the network attached storage:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no vrf nas
```

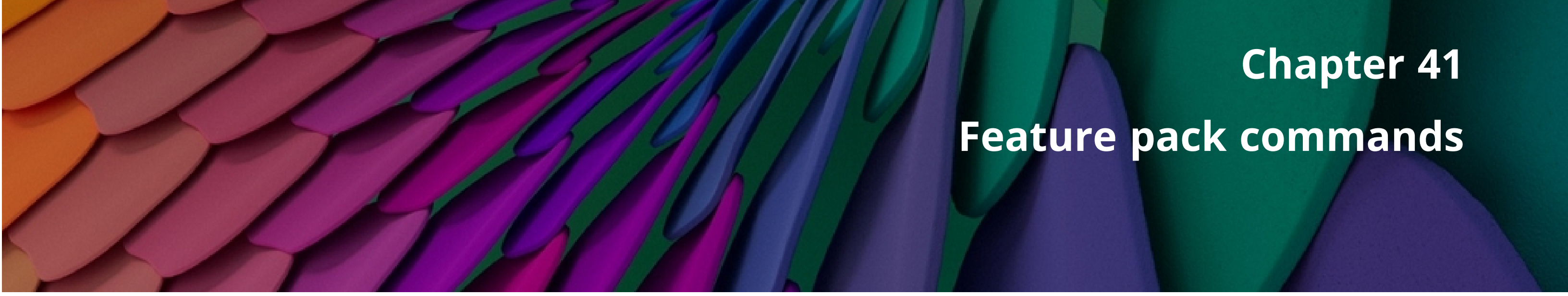
For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-external-storage-<VOLUME-NAME>`	Administrators or local user group members with execution rights for this command.



Chapter 41
Feature pack commands

erase feature-pack

erase feature-pack [reset]

Description

Remove the installed feature pack and delete the feature pack file.

Parameter	Description
`reset`	*Optional*. Include this parameter if you do not want to use subscription features anymore and want to stop receiving honor mode warning logs messages. **Running this command will disable all subscription features and stop honor warnings**.

Example

Remove the feature pack. The switch will continue to operate in honor mode.

```
switch# erase feature-pack
```

Remove the feature pack and disable all subscription features.

```
switch# erase feature-pack reset

This operation will delete the feature pack subscription key and reset
feature pack enforcement to a factory default state. This will disable
advanced features that require a subscription to operate and may impact
network operation if those features are in use.

After running this command, advanced features can only be re-enabled
through one of the following:
1. Installing a new feature-pack subscription key.
2. Connecting to Aruba Central.
3. Configuring honor mode.


Continue (y/n)?
```

For more information on features that use this command, refer to the Feature Pack Configuration Guide for your switch model.

Command History

Release	Modification
10.14	The **reset** parameter is introduced.
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`manager`	Administrators or local user group members with execution rights for this command.

feature-pack mode

```
feature-pack mode
   cloud-managed
   file-based
   honor
   no ...
```

Description

Set the operation mode for a feature pack deployment.

HPE Aruba networking provides three modes for feature pack management: **cloud-managed**, **file-based**, and **honor**. In the event of a mismatch between the installed feature pack and the feature pack mode, the device will operate in honor mode.

Parameter	Description
`cloud-managed`	The device uses cloud-based feature pack management
`file-managed`	The device uses a manually installed feature pack file. This is the default feature pack mode.
`honor`	A valid feature pack has been obtained, but is not yet installed.
`no ...`	Resets the configuration back to the default file-based feature pack mode.

Usage

Switches using feature pack subscription keys in ***cloud mode*** share a pool of one or more feature pack subscription keys managed using the HPE Aruba Networking support portal. By default, a switch using an HPE Aruba Networking CX feature pack in cloud mode will contact the HPE Aruba Networking support portal once a day to automatically synchronize with the feature pack subscription key management database. With this deployment type, the HPE Aruba Networking support site can automatically distribute and manage feature packs for all devices in a group, making it a scalable solution for larger deployments and for global accounts across geographies.

Networks with a single switch, or with multiple switches on isolated networks that cannot contact the HPE Aruba Networking support site should use feature pack subscription keys in ***file-based mode***, where a feature pack is manually enabled on a switch using a non-sharable subscription key tied to that individual switch's serial number or MAC address.

Honor mode is intended for cases where a valid feature pack for advanced features has been purchased, but is not yet installed on the device. Advanced features on this device will be operational in Honor mode, but a warning message may be seen until a valid feature pack is installed. Please note that HPE Aruba Networking will remove support for Honor mode in a future release and advanced features will only be operational if the applicable subscription fees are paid and a valid feature pack is installed.

Examples

```
switch(config)# feature pack mode cloud-managed
```

For more information on features that use this command, refer to the Feature Pack Configuration Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

feature-pack server

```
feature-pack server
  block <block>
  credentials user <USER> password [{plaintext <PASSWORD>}|{ciphertext <PASSWORD>}]
  location <LOCATION> [vrf <VRF>]
  pool <pool>
```

Description

If the switch is in cloud-managed feature pack mode, use this command to define the switch's feature pack profile. A switch in cloud-managed mode uses the information in this profile to contact the feature pack management server and download and install any allocated feature packs.

Parameter	Description
`block <block>`	If the subscription pool for the profile contains more than one subscription block, specify the subscription block within that pool to be assigned.
`credentials`	Configures the credentials used by the device to contact and authenticate to the feature pack server.
`user <USER>`	The user name of a feature pack server account.

Parameter	Description
`password`	Select a mode for entering the feature pack server password. If you press **<enter>** after the **password** parameter, you will enter a secure prompt that allows you to securely enter a hidden password. *This is the recommended method for entering a plaintext password.* You can include the optional **plaintext** parameter to configure a plain text password (not recommended), or use the optional **ciphertext** parameter to enter previously encrypted ciphertext password.
`plaintext <PASSWORD>`	Optional. Enter a password in plain text without the secure prompt. *This option does not hide the password in the CLI, and is not recommended.*
`ciphertext <PASSWORD>`	Optional. Enter a password as previously encrypted text. *This is the recommended method for entering an encrypted password.*
`location <LOCATION>`	The FQDN of the feature pack server; https://cx-feature-pack.arubanetworks.com
`[vrf <VRF>]`	(Optional) Specify the VRF used to contact the feature pack server.
`pool <pool>`	Configures the feature pack server subscription pool. This information is used by the feature pack server to properly identify the subscription to be assigned to the device.

Examples

Defining a feature pack server by entering a hidden plain text user password.

```
switch(config)# feature-pack server
switch(config-feature-pack-server)# location https://cx-feature-
pack.arubanetworks.com vrf mgmt
switch(config-feature-pack-server)# credentials user myLMSUser1234 password
Enter password: *****
Confirm password: *****
```

Defining a feature pack server with an encrypted ciphertext user password.

```
switch(config)# feature-pack server
switch(config-feature-pack-server)# location https://cx-feature-
pack.arubanetworks.com vrf mgmt
switch(config-feature-pack-server)# credentials user myLMSUser1234 password
ciphertext
AQBapcmUTsCVdaTGkLA3mN2sslLgsNOdqFUP0j+CaCxVdz7oEwAA2OmsmBmgPHavS+6Gkgm2twE4NU1Y=
```

For more information on features that use this command, refer to the Feature Pack Configuration Guide for your switch model.

Command History

Release	Modification
10.13.1000	Plaintext passwords should now be configured using the secure prompt, which can be accessed by pressing **<enter>** after the **password** keyword. This makes the **plaintext** and **ciphertext** keywords optional. It is recommended to use either the secure prompt or the ciphertext option.
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-feature-pack-server`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

feature-pack validate

`feature-pack validate`

Description

Manually trigger a feature pack validation on the HPE Aruba Networking support portal. (By default, automatic validation happens once every day.) This command is only applicable for feature packs in cloud-managed mode.

Examples

```
switch# feature-pack validate
```

For more information on features that use this command, refer to the Feature Pack Configuration Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`manager`	Administrators or local user group members with execution rights for this command.

show feature-pack

```
show feature-pack [server]
```

Description

Display the current feature pack summary and status, and feature status of features that require a feature pack.

Parameter	Description
server	(Optional) For feature packs in cloud-managed mode, Include this parameter to display configuration settings used to connect to the feature pack management server, and display the connection status information.

Examples

```
switch# show feature-pack
Feature Pack Summary
===============
Name              : CX Software Advanced Feature Pack
Expiration Date   : Thu May 4 2025
Serial Number(s) : TW13KM304V
MAC Address       : 90:20:c2:c4:98:00
Hostname          : 6405
Mode              : File based
Status            : feature pack installed and valid
Error Reason      : None

                                                Subscription   Feature
Feature                                         Status         Status
---------------------------------------------------------------------
Application Based Policy                        active          allowed
Application Recognition                         active          allowed
MACsec extensions for WAN                       active          allowed
Reflexive Policies for Port Access GBP Clients  active          allowed
Reflexive Policies for Port Access Clients      active          allowed
```

```
switch# switch# show feature-pack server
Profile
=======
Location URL           : https://cx-feature-pack.arubanetworks.com
Location VRF           : mgmt
User account           : customer@example.com
Subscription Pool      : default
Subscription Block     : 6300_test_block_2
Connection
==========
Status                  : Validation success
Reason                  : --
Last validation time    : Tue Sep 12 09:27:42 UTC 2023
Success validation time : Tue Sep 12 09:27:42 UTC 2023
```

The output of the **show feature-pack** command include the following information:

Value	Description
Name	Name of the feature pack
Expiration Date	The date that the feature pack subscription expires
Serial Numbers	Serial numbers for that feature pack. If the feature pack is used by multiple switches (for example, in a VSF deployment) then the **Serial Number(s)** field displays all the switch serial numbers for that feature pack.
MAC address	MAC address of the switch using the feature pack
Hostname	Host name of the switch using the feature pack
Type	Shows the feature pack file type: ■ **Device specific**: Feature pack was manually downloaded from a feature pack server account in local mode. Use this feature pack with a switch in file-based mode.. ■ **Floating**: The feature pack was automatically downloaded from a cloud mode feature pack account on the HPE Aruba Networking support portal. This feature pack should be used with the switch in cloud-managed mode.
Mode	Shows the feature pack configuration mode: ■ **Cloud management**: Switches using feature pack subscriptions in cloud-managed mode share a pool of one or more feature pack subscriptions. These subscriptions are managed through the HPE Aruba Networking support portal. ■ **File Based**: If a switch is using a feature pack in **file-based mode**, you must manually upload the feature pack using the **copy** command and enable it on a switch using a non-sharable subscription file tied to that individual switch's serial number or MAC address. ■ **Honor**: Honor mode is intended for cases where a valid feature pack for advanced features has been purchased, but is not yet installed on the device. Advanced features on this device will be operational in honor mode, but a warning message may be seen until a valid feature pack is installed. Please note that HPE Aruba Networking will remove support for Honor mode in a future release and advanced features will only be operational if the applicable subscription fees are paid and a valid feature pack is installed. This message is shown when the switch is configured to use a cloud-managed feature pack profile using the **feature pack mode cloud-managed** command.
Status	This message displays the current status of the feature pack: ■ **No feature pack installed**: No feature pack is detected on the switch. ■ **Feature pack installed and valid**: Feature pack installed with no errors.

Value	Description
	- **Feature pack install error**: The feature pack has invalid data. - **Feature pack expired**: The feature pack subscription has expired. - **Feature pack removed**: The feature pack was erased from the switch using the **erase** command. - **Subscription through Aruba Central is connected**: Switch is actively connected to HPE Aruba Networking Central. Subscription features are operational. The feature-pack on the switch will display this state only if *all* the following are true: ◦ The switch has a connection to Central. ◦ The switch is onboarded to the GreenLake for PrivateCloud (GLPC) device inventory . ◦ The switch is assigned to Central Application. ◦ The switch has a valid Central License assigned. - **Subscription through Aruba Central is disconnected**: Switch is disconnected from HPE Aruba Networking Central. Subscription features are still operational. The switch will appear in this state if any of the requirements for the status is not currently true, A switch may also display this feature pack status if the switch has connection to Central, is assigned to the Central application, but has no Central License attached. In this case the switch will be in disconnected state even if it never was previously in connected state. - **Feature pack mode honor configured**: The switch does not have a valid feature pack. Subscription features are operational, and is operating in honor mode until the feature pack is installed. - **Cloud managed server is disconnected**: The switch is managing feature packs in cloud mode, but the switch is no longer able to reach the HPE Aruba Networking support portal. The switch will continue to operate in honor mode. - **Cloud managed and subscription revoked from server**: The switch is managing the feature pack in cloud mode, but feature pack has been revoked from the switch through the HPE Aruba Networking support portal.The switch will continue to operate in honor mode until the feature pack is removed from the switch. - **Cloud managed server validation error**: Server validation failed. Issue the command **show feature pack server** for more information. - **Unexpected VSF member in stack**: A feature pack intended for a VSF stack is installed on a VSF member whose serial number is not covered under the current feature pack. - **Mode does not match installed feature pack type**: The feature pack type (device-locked or floating) does not match the configured mode. Device-locked feature packs should be

Value	Description
	used in file-based deployments only, and floating feature packs should be used by cloud-managed deployments.
Error Reason	If the feature pack **Status** field displays an error status, this field displays details about possible causes for the issue. ▪ **Serial number mismatch**: The serial number in the installed feature pack does not match the switch's serial number. ▪ **MAC address mismatch**: The MAC address in the installed feature pack does not match the switch's serial number. ▪ **Feature pack file parsing error**: The feature pack file has an invalid format. ▪ **Feature pack file signature invalid**: The feature pack file was modified.
Feature	Feature supported by the feature pack.
Subscription Status	Current subscription status; ▪ **active**: Subscrition is active ▪ **inactive**: Subscription is inactive or has expired ▪ **honor**: Installed feature pack has expired or cloud managed feature pack has encountered an error. Warnings will be logged periodically.
Feature Pack Status	Current status of the feature pack: ▪ **allowed**: Feature is functional ▪ **blocked**: Feature is not functional and will require a valid feature pack to be functional

The output of the **show feature-pack** server command include the following information:

Location URL	Fully qualified domain name of the feature pack subscription server, for example, **https://cx-feature-pack.arubanetworks.com**
Location VRF	VRF used to access the feature pack subscription server.
User Account	User name of the user account at the HPE Aruba Networking support portal associated with the feature pack.
Subscription Pool	Name of the subcription pool associated with the feature pack. This can be the **Default** subscription pool, or a user-defined subscription pool.
Subscription Block	Subscription block associated with the feature pack.
Status	Indicates whether the switch was able to contact the feature pack server.
Reason	If the switch is unable to contact the feature pack server, this field can display information about the cause for the connection failure.
Last validation time	Timestamp showing the date and time the switch last contacted

	the feature pack server.
Success Validation time	Timestamp showing the date and time of the last successful feature pack installation or validation against the feature pack server

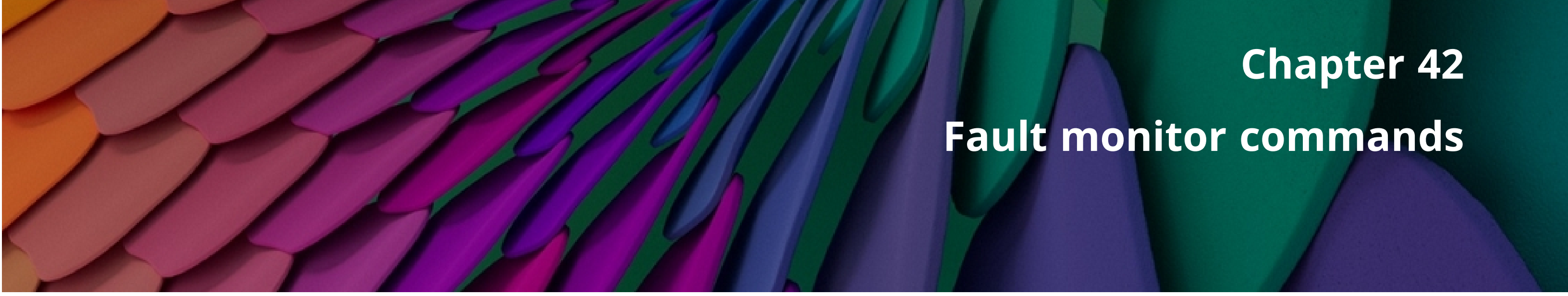
For more information on features that use this command, refer to the Feature Pack Configuration Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`manager`	Administrators or local user group members with execution rights for this command.



Chapter 42

Fault monitor commands

(Fault enabling/disabling)

```
{all | <FAULT>}
no {all | <FAULT>}
```

Description

Within the selected fault monitor profile context, enables all faults or specific faults for monitoring.

By default, all faults are disabled in a profile and remain disabled until enabled as described here. Configuring the action and threshold does not enable the fault.

Faults enabled with this command use default actions and thresholds unless the actions and thresholds are configured. For information on configuring actions and thresholds for a fault, respectively see action and threshold.

The **no** form of this command disables faults for monitoring.

Parameter	Description
`all`	Selects all faults.

`<FAULT>`	Selects a specific fault. Available fault names:
	`excessive-broadcasts`
	`excessive-multicasts`
	`excessive-link-flaps`
	`excessive-oversize-packets`
	`excessive-jabbers`
	`excessive-fragments`
	`excessive-crc-errors`
	`excessive-late-collisions`
	`excessive-collisions`
	`excessive-tx-drops`

Examples

Enabling all faults:

```
switch(config-fault-monitor-profile)# all
```

Disabling all faults:

```
switch(config-fault-monitor-profile)# no all
```

Enabling individual faults:

```
switch(config-fault-monitor-profile)# excessive-broadcasts
switch(config-fault-monitor-profile)# excessive-multicasts
switch(config-fault-monitor-profile)# excessive-link-flaps
switch(config-fault-monitor-profile)# excessive-oversize-packets
switch(config-fault-monitor-profile)# excessive-jabbers
switch(config-fault-monitor-profile)# excessive-fragments
switch(config-fault-monitor-profile)# excessive-crc-errors
switch(config-fault-monitor-profile)# excessive-late-collisions
switch(config-fault-monitor-profile)# excessive-collisions
switch(config-fault-monitor-profile)# excessive-tx-drops
```

Disabling individual faults:

```
switch(config-fault-monitor-profile)# no excessive-broadcasts
switch(config-fault-monitor-profile)# no excessive-multicasts
switch(config-fault-monitor-profile)# no excessive-link-flaps
switch(config-fault-monitor-profile)# no excessive-oversize-packets
switch(config-fault-monitor-profile)# no excessive-jabbers
switch(config-fault-monitor-profile)# no excessive-fragments
switch(config-fault-monitor-profile)# no excessive-crc-errors
switch(config-fault-monitor-profile)# no excessive-late-collisions
switch(config-fault-monitor-profile)# no excessive-collisions
switch(config-fault-monitor-profile)# no excessive-tx-drops
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-fault-monitor-profile`	Administrators or local user group members with execution rights for this command.

action

```
{all | <FAULT>} action {notify | notify-and-disable [auto-enable <TIMEOUT>]}
no {all | <FAULT>} action {notify | notify-and-disable [auto-enable <TIMEOUT>]}
```

Description

Within the selected fault monitor profile context, configures the fault monitoring action for the specified fault. Default action: **notify** with **auto-enable** disabled.

The no form of this command removes the action and disables **auto-enable**.

Parameter	Description
`all`	Selects all faults.

<FAULT>	Selects a specific fault. Available fault names:
	`excessive-broadcasts`
	`excessive-multicasts`
	`excessive-link-flaps`
	`excessive-oversize-packets`
	`excessive-jabbers`
	`excessive-fragments`
	`excessive-crc-errors`
	`excessive-late-collisions`
	`excessive-collisions`
	`excessive-tx-drops`

`notify`	Selects the `notify` action. Notifies through events, DLOGs, and SNMP trap. This action is enabled by default.
`notify-and-disable`	Selects the action as `notify-and-disable`. Notifies through events, DLOGs, and SNMP trap, and then disables the port.
`auto-enable` *<TIMEOUT>*	Sets the number of seconds after which a port disabled by the `notify-and-disable` action is automatically re-enabled. Range: 1 to 604800 seconds.

The fault parameter values are saved even after a fault is disabled in the profile. The saved values will be used if the fault is later re-enabled in the profile again.

Examples

Configuring the **notify** action for all faults within a given profile:

```
switch(config-fault-monitor-profile)# all action notify
```

Configuring the `notify-and-disable` action for all faults within a given profile:

```
switch(config-fault-monitor-profile)# all action notify-and-disable
```

Configuring the **notify-and-disable** action for all faults with **auto-enable** within a given profile:

```
switch(config-fault-monitor-profile)# all action notify-and-disable auto-enable 80
```

Disabling all fault monitoring for this profile:

```
switch(config-fault-monitor-profile)# no all
```

Restoring all fault monitoring to the default action **notify** within a given profile:

```
switch(config-fault-monitor-profile)# no all action
```

Unconfiguring the auto-enable timer for all fault monitoring within a given profile:

```
switch(config-fault-monitor-profile)# no all action notify-and-disable auto-enable
```

Configuring the **notify** action for specific faults within a given profile:

```
switch(config-fault-monitor-profile)# excessive-oversize-packets action notify
switch(config-fault-monitor-profile)# excessive-late-collisions action notify-and-
disable
switch(config-fault-monitor-profile)# excessive-collisions action notify-and-
disable
```

Configuring the **notify-and-disable** action for specific faults within a given profile:

```
switch(config-fault-monitor-profile)# excessive-link-flaps action notify-and-
disable
switch(config-fault-monitor-profile)# excessive-fragments action notify-and-
disable
switch(config-fault-monitor-profile)# excessive-crc-errors action notify-and-
disable
```

Configuring the **notify-and-disable** action with **auto-enable** for specific faults within a given profile:

```
switch(config-fault-monitor-profile)# excessive-broadcasts action notify-and-
disable auto-enable 80
switch(config-fault-monitor-profile)# excessive-multicasts action notify-and-
disable auto-enable 100
switch(config-fault-monitor-profile)# excessive-tx-drops action notify-and-disable
auto-enable 70
switch(config-fault-monitor-profile)# excessive-jabbers action notify-and-disable
auto-enable 60
```

Restoring fault monitoring to the default action **notify** within a given profile:

```
switch(config-fault-monitor-profile)# no excessive-oversize-packets action
switch(config-fault-monitor-profile)# no excessive-jabbers action
switch(config-fault-monitor-profile)# no excessive-oversize-packets action notify-
and-disable
```

Unconfiguring the auto-enable timer within a given profile:

```
switch(config-fault-monitor-profile)# no excessive-jabbers action notify-and-
disable auto-enable
switch(config-fault-monitor-profile)# no excessive-collisions action notify-and-
disable auto-enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-fault-monitor-profile`	Administrators or local user group members with execution rights for this command.

apply fault-monitor profile

```
apply fault-monitor profile <PROFILE-NAME>
no apply fault-monitor profile [<PROFILE-NAME>]
```

Description

Applies a fault monitoring profile to the selected interface or interface range.

The **no** form of this command removes the fault monitoring profile from the selected interface or interface range.

Parameter	Description
<PROFILE-NAME>	Specifies the fault monitor profile name. Range: Up to 64 alphanumeric and special characters.

Examples

Applying the fault monitoring profile to a interface:

```
switch(config)# interface 1/1/1
switch(config-if)# apply fault-monitor profile noisy-ports
```

Applying the fault monitoring profile to a interface range:

```
switch(config)# interface 1/1/2-1/1/24
switch(config-if)# apply fault-monitor profile quiet-ports
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Made the *<PROFILE-NAME>* parameter optional in the **no** form of the command.

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

fault-monitor profile

```
fault-monitor profile <PROFILE-NAME>
no fault-monitor profile <PROFILE-NAME>
```

Description

Creates a fault monitoring profile and enters its context which is indicated as **(config-fault-monitor-profile)**. If the profile already exists, this command enters the profile context. A maximum of 16 fault monitoring profiles are supported.

For information on enabling a fault within a fault monitor profile, see (Fault enabling/disabling).

For information on configuring actions and thresholds for a fault, respectively see action and threshold.

For information on applying a fault monitor profile to a interface or interface range, see apply fault-monitor profile.

The **no** form of this command deletes the fault monitoring profile.

By default, all faults are disabled in a profile.

Parameter	Description
<PROFILE-NAME>	Specifies the fault monitor profile name. Range: Up to 64 alphanumeric and special characters.

Examples

Creating a fault monitor profile and entering its context:

```
switch(config)# fault-monitor profile noisy-ports
switch(config-fault-monitor-profile)#
```

Deleting a fault monitor profile:

```
switch(config)# no fault-monitor profile noisy-ports
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show fault-monitor profile

`show fault-monitor profile <PROFILE-NAME>`

Description

Shows fault monitoring profile information for all profiles or a specific profile.

Parameter	Description
<PROFILE-NAME>	Specifies the fault monitor profile name. Range: Up to 64 alphanumeric and special characters.

Example

Showing information for all fault monitoring profiles:

```
switch# show fault-monitor profile
-------------------------------------------------------------------------------
Fault monitor profile: noisy-ports
-------------------------------------------------------------------------------
Auto
Fault                           Enabled  Threshold   Action              Enable
-------------------------------------------------------------------------------
excessive-broadcasts            yes      5%          notify-and-disable  --
excessive-multicasts            yes      1000 pps    notify-and-disable  --
excessive-link-flaps            yes      7           notify-and-disable  --
excessive-oversize-packets      yes      25          notify-and-disable  --
excessive-jabbers               yes      25          notify-and-disable  --
excessive-fragments             yes      25          notify-and-disable  --
excessive-crc-errors            yes      25          notify-and-disable  --
excessive-late-collisions       yes      25          notify-and-disable  --
excessive-collisions            yes      25          notify-and-disable  --
excessive-tx-drops              yes      25          notify-and-disable  --
-------------------------------------------------------------------------------
Fault monitor profile: quiet-ports
-------------------------------------------------------------------------------
Auto
Fault                           Enabled  Threshold   Action              Enable
-------------------------------------------------------------------------------
excessive-broadcasts            yes      20%         notify-and-disable  --
excessive-multicasts            yes      25000 pps   notify-and-disable  40
excessive-link-flaps            yes      7           notify              --
excessive-oversize-packets      yes      30          notify-and-disable  --
excessive-jabbers               no       30          notify-and-disable  100
excessive-fragments             yes      30          notify-and-disable  --
```

```
excessive-crc-errors            yes      30          notify-and-disable  --
excessive-late-collisions       yes      30          notify-and-disable  --
excessive-collisions            yes      30          notify-and-disable  --
excessive-tx-drops              yes      30          notify-and-disable  --
```

Showing information for a particular fault monitoring profile:

```
switch# show fault-monitor profile noisy-ports
--------------------------------------------------------------------------------
Fault monitor profile: noisy-ports
--------------------------------------------------------------------------------
Auto
Fault                           Enabled  Threshold   Action              Enable
--------------------------------------------------------------------------------
excessive-broadcasts            yes      5%          notify-and-disable  --
excessive-multicasts            yes      1000 pps    notify-and-disable  --
excessive-link-flaps            yes      7           notify-and-disable  --
excessive-oversize-packets      yes      25          notify-and-disable  --
excessive-jabbers               yes      25          notify-and-disable  --
excessive-fragments             yes      25          notify-and-disable  --
excessive-crc-errors            yes      25          notify-and-disable  --
excessive-late-collisions       yes      25          notify-and-disable  --
excessive-collisions            yes      25          notify-and-disable  --
excessive-tx-drops              yes      25          notify-and-disable  --
--------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show interface fault-monitor profile

```
show interface [<INTERFACE>|<IF-RANGE>] fault-monitor profile
```

Description

Shows fault monitoring profile configuration information for all or specific interfaces.

Parameter	Description
<INTERFACE>	Specifies a single interface.

Parameter	Description
<IF-RANGE>	Specifies a interface range,

Example

Showing all interfaces with applied fault monitoring profiles:

```
switch# show interface fault-monitor profile
---------------------------------------------------------------------------
Port     Fault Monitor Profile
---------------------------------------------------------------------------
1/1/1    noisy-ports
1/1/2    quiet-ports
1/1/4    quiet-ports
1/1/5    noisy-ports
1/1/6    noisy-ports
1/1/7    quiet-ports
```

Showing a range of interfaces with applied fault monitoring profiles:

```
switch# show interface 1/1/1-1/1/2,1/1/6 fault-monitor profile
---------------------------------------------------------------------------
Port     Fault Monitor Profile
---------------------------------------------------------------------------
1/1/1    noisy-ports
1/1/2    quiet-ports
1/1/6    noisy-ports
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show interface fault-monitor status

`show interface [<INTERFACE>|<IF-RANGE>] fault-monitor status`

Description

Shows active fault information for all or specific interfaces.

Parameter	Description
<INTERFACE>	Specifies a single interface.
<IF-RANGE>	Specifies a interface range,

Example

Showing active fault information for all interfaces with applied fault monitoring profiles:

```
switch# show interface fault-monitor status
                                                                 Port  Time
Port   Fault                       Fault Elapsed Time            State Left
--------------------------------------------------------------------------------
1/1/1  excessive-broadcasts        Tue Apr 14 14:29:09 UTC 2020  down  60
       excessive-jabbers           Tue Apr 15 14:29:09 UTC 2020  --    --
1/1/2  excessive-oversize-packets  Tue Apr 16 14:29:09 UTC 2020  down  --
```

Showing active fault information for a range of interfaces with applied fault monitoring profiles:

```
switch# show interface 1/3/1,1/3/3 fault-monitor status
                                                                 Port  Time
Port   Fault                       Occurring Since               State Left
--------------------------------------------------------------------------------
1/1/4  excessive-broadcasts        Tue Apr 14 14:29:09 UTC 2020  down  60
       excessive-jabbers           Tue Apr 15 14:29:09 UTC 2020  --    100
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config

```
show running-config [interface <IFNAME> | current-context | all]
```

Description

Shows the running configuration including any fault-monitor profile configurations and profile-names applied to an interface. The below examples focus on fault monitor-related configuration items. Other configuration items that may be present are represented by an ellipsis (. . .).

Parameter	Description
`interface <IFNAME>`	Shows running configuration information for only the specified interface.
`current-context`	Shows running configuration information for only the current context.
`all`	Shows all running configuration information.

Examples

Showing the running configuration for a particular interface:

```
switch# show running-config interface 1/1/1
interface 1/1/1
   ...
    apply fault-monitor profile noisy-ports
   ...
```

Showing the running configuration for a particular fault monitor profile current context:

```
switch# fault-monitor profile noisy-ports
switch(config-fault-monitor-profile)# show running-config current-context
fault-monitor profile noisy-ports
    excessive-broadcasts
    excessive-broadcasts threshold pps 10000
    excessive-broadcasts action notify-and-disable auto-enable 2000
    excessive-multicasts
    excessive-multicasts threshold pps 10000
    excessive-link-flaps
    excessive-link-flaps action notify-and-disable auto-enable 2000
```

Showing all running configuration:

```
switch# show running-config all
...
fault-monitor profile noisy-ports
    excessive-broadcasts
    excessive-broadcasts threshold pps 10000
    excessive-broadcasts action notify-and-disable auto-enable 2000
    excessive-multicasts
    excessive-multicasts threshold pps 10000
    excessive-multicasts action notify
    excessive-link-flaps
    excessive-link-flaps threshold count 7
    excessive-link-flaps action notify-and-disable auto-enable 2000
    no excessive-oversize-packets
    excessive-oversize-packets threshold value 25
    excessive-oversize-packets action notify
    no excessive-jabbers
    excessive-jabbers threshold value 25
    excessive-jabbers action notify
    no excessive-fragments
    excessive-fragments threshold value 25
    excessive-fragments action notify
    no excessive-crc-errors
    excessive-crc-errors threshold value 25
    excessive-crc-errors action notify
    no excessive-late-collisions
    excessive-late-collisions threshold value 25
    excessive-late-collisions action notify
    no excessive-collisions
    excessive-collisions threshold value 25
    excessive-collisions action notify
    no excessive-tx-drops
    excessive-tx-drops threshold value 25
    excessive-tx-drops action notify
...
interface 1/1/1
   ...
    apply fault-monitor profile noisy-ports
   ...
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

threshold

```
<FAULT> threshold value <VALUE>
no <FAULT> threshold [value <VALUE>]

excessive-link-flaps threshold count <COUNT>
no excessive-link-flaps threshold [count <COUNT>]

excessive-fc-watchdog-triggers threshold count <COUNT>
no excessive-fc-watchdog-triggers threshold [count <COUNT>]

{excessive-broadcasts | excessive-multicasts}
   threshold {percent <BW-PERCENT> | pps <PPS>}
no {excessive-broadcasts | excessive-multicasts}
   threshold [{percent <BW-PERCENT> | pps <PPS>}]

no all threshold
```

Description

Within the selected fault monitor profile context, sets the specified fault threshold.

The **no** form of this command resets the threshold to its default value.

Parameter	Description

`<FAULT> threshold value <VALUE>`
With `<FAULT>` set to any of these names:
`excessive-oversize-packets`
`excessive-jabbers`
`excessive-fragments`
`excessive-crc-errors`
`excessive-late-collisions`
`excessive-collisions`
`excessive-tx-drops`
	Sets the threshold number of bad frames per 10000 good frames received or per 10000 good frames sent (depending on the fault), to be considered a fault. Range: 1 to 10000. Default: 25.

`excessive-link-flaps threshold count <COUNT>`	Sets the threshold count of interface link flaps, during a 10 second sampling interval, to be considered a fault. Range: 1 to 100. Default: 7.
`{excessive-broadcasts | excessive-multicasts} threshold percent <BW-PERCENT>`	Sets the fault threshold as a percentage of port bandwidth for minimum sized packets that is considered to be a fault. Range: 1 to 100. Default 5.
`{excessive-broadcasts | excessive-multicasts} threshold pps <PPS>`	Sets the fault threshold in packets per second. Range: 1 to 195312500.

If excessive-broadcast or excessive-multicast faults are configured with the threshold higher than the `rate-limit` threshold, the following occurs:

- Fault reporting still happens as the port has actually received packets at a rate that violated its threshold.
- Traffic gets shaped as per `rate-limit` configuration and any packet exceeding the `rate-limit` threshold gets dropped.

Examples

Setting thresholds:

```
switch(config-fault-monitor-profile)# excessive-oversize-packets threshold value
40
switch(config-fault-monitor-profile)# excessive-jabbers threshold value 30
switch(config-fault-monitor-profile)# excessive-fragments threshold value 50
switch(config-fault-monitor-profile)# excessive-crc-errors threshold value 35
switch(config-fault-monitor-profile)# excessive-late-collisions threshold value 30
switch(config-fault-monitor-profile)# excessive-collisions threshold value 40
switch(config-fault-monitor-profile)# excessive-tx-drops threshold value 20

switch(config-fault-monitor-profile)# excessive-link-flaps threshold count 14
switch(config-fault-monitor-profile)# excessive-broadcasts threshold percent 40
switch(config-fault-monitor-profile)# excessive-multicasts threshold pps 7500
```

Resetting all thresholds to their defaults:

```
switch(config-fault-monitor-profile)# no all threshold
```

Resetting individual thresholds to their defaults:

```
switch(config-fault-monitor-profile)# no excessive-oversize-packets threshold
switch(config-fault-monitor-profile)# no excessive-jabbers threshold
switch(config-fault-monitor-profile)# no excessive-fragments threshold
switch(config-fault-monitor-profile)# no excessive-crc-errors threshold
switch(config-fault-monitor-profile)# no excessive-late-collisions threshold
switch(config-fault-monitor-profile)# no excessive-collisions threshold
switch(config-fault-monitor-profile)# no excessive-tx-drops threshold

switch(config-fault-monitor-profile)# no excessive-link-flaps threshold

switch(config-fault-monitor-profile)# no excessive-broadcasts threshold
switch(config-fault-monitor-profile)# no excessive-multicasts threshold
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-fault-monitor-profile`	Administrators or local user group members with execution rights for this command.

vsx-sync (fault monitor)

```
vsx-sync
no vsx-sync
```

Description

Within the selected fault monitor profile context, configures VSX synchronization for the selected fault monitoring profile.

The **no** form of this command removes the VSX synchronization for a fault monitoring profile.

Example

Configuring VSX synchronization for a fault monitoring profile:

```
switch(config-fault-monitor-profile)# vsx-sync
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6400	`config-fault-monitor-profile`	Administrators or local user group members with execution rights for this command.

Chapter 43

Firmware management commands

copy {primary | secondary} *<REMOTE-URL>*

`copy {primary | secondary} <REMOTE-URL> [vrf <VRF-NAME>]`

Description

Uploads a firmware image to a TFTP or SFTP server.

Parameter	Description
`{primary | secondary}`	Selects the primary or secondary image profile to upload. Required

`<REMOTE-URL>`	Specifies the URL to receive the uploaded firmware using SFTP , TFTP or SCP.
	TFTP format:
	`tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME>`
	SFTP format:
	`sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME>`
	SCP format:
	`scp://USER@{IP|HOST}[:PORT]/FILE`

`vrf <VRF-NAME>`	Specifies a VRF name. Default: default.

Examples

TFTP upload:

```
switch# copy primary tftp://192.0.2.0/00_10_00_0002.swi
######################################################################## 100.0%
Verifying and writing system firmware...
```

SFTP upload:

```
switch# copy primary sftp://swuser@192.0.2.0/00_10_00_0002.swi
swuser@192.0.2.0's password:
Connected to 192.0.2.0.
sftp> put primary.swi XL_10_00_0002.swi
Uploading primary.swi to /users/swuser/00_10_00_0002.swi
primary.swi                              100%  179MB  35.8MB/s   00:05
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy {primary | secondary} *<FIRMWARE-FILENAME>*

`copy {primary | secondary} <FIRMWARE-FILENAME>`

Description

Copies a firmware image to USB storage.

Parameter	Description
`{primary	secondary}`	Selects the primary or secondary image from which to copy the firmware. Required
`<FIRMWARE-FILENAME>`	Specifies the name of the firmware file to create on the USB storage device. Prefix the filename with **usb:/**. For example: **usb:/firmware_v1.2.3.swi** For information on how to format the path to a firmware file on a USB drive, see USB URL.

Examples

```
switch# copy primary usb:/11.10.00.0002.swi
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy primary secondary

```
copy primary secondary
```

Description

Copies the firmware image from the primary to the secondary location.

Examples

```
switch# copy primary secondary
The secondary image will be deleted.

Continue (y/n)? y
Verifying and writing system firmware...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy *<REMOTE-URL>*

```
copy <REMOTE-URL> {hot-patch|primary|secondary} [vrf <VRF-NAME>]
```

Description

Downloads a hot-patch or firmware image from a TFTP or SFTP server.

Parameter	Description
<REMOTE-URL>	Specifies the URL from which to download the firmware using SFTP or TFTP. **TFTP format:**

Parameter	Description

	`tftp://<IP-ADDR>[:<PORT-NUM>]`
	`[;blocksize=<Value>]/<FILENAME>`
	SFTP format:
	`sftp://<USERNAME>@<IP-ADDR>`
	`[:<PORT-NUM>]/<FILENAME>`
	SCP format:
	`scp://USER@{IP|HOST}[:PORT]/FILE`

`{hot-patch|primary|secondary}`	Select a hot-patch or a primary or secondary image profile for receiving the downloaded firmware. Required. **NOTE:** For more information about hot-patch, see hot-patch.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

TFTP usage

To specify a URL with:

- an IPv4 address: **tftp://*192.0.2.1/a.txt***
- an IPv6 address: **tftp://*[2000::2]/a.txt***
- a hostname: **tftp://*hpe.com/a.txt***

To specify TFTP with:

- the port number of the server in the URL: **tftp://*192.0.2.1:12/a.txt***
- the blocksize in the URL: **tftp://*192.0.2.1*;blocksize=*1462/a.txt***

The valid blocksize range is 8 to 65464.

- the port number of the server and blocksize in the URL: **tftp://192.0.2.1:*12*;blocksize=*1462/a.txt***

To specify a file in a directory of URL: **tftp://*192.0.2.1/dir/a.txt***

SFTP usage

To specify:

- A URL with an IPv4 address: **sftp://*user@192.0.2.1/a.txt***
- A URL with an IPv6 address: **sftp://*user@[2000::2]/a.txt***
- A URL with a hostname: **sftp://*user@hpe.com/a.txt***
- SFTP port number of a server in the URL: **sftp://*user@192.0.2.1:12/a.txt***
- A file in a directory of URL: **sftp://*user@192.0.2.1/dir/a.txt***
- To specify a file with absolute path in the URL: **sftp://*user@192.0.2.1//home/user/a.txt***

SCP Usage

To specify:

- A username with an IP address: **scp://user@192.0.2.1:12/a.txt**
- A username with a remote host: **scp://user@hpe.com/a.txt**

Examples

TFTP download for a hot-patch:

```
switch# copy tftp://192.168.1.1/FL.10.12.0001-0002.patch hot-patch vrf vrf1

Fetching /users/swuser/FL.10.10.0001-0002.patch to hotpatch.dnld.uE2YT1
FL.10.12.0001-0002.patch                   100%   62KB  12.4MB/s   00:00

Verifying and writing hot-patch...
```

TFTP download for primary software image:

```
switch#  copy tftp://192.10.12.0/FL_10_12_0001.swi primary
The primary image will be deleted.

Continue (y/n)? y
######################################################################### 100.0%
Verifying and writing system firmware...
```

SFTP download:

```
switch# copy sftp://swuser@192.10.12.0/FL_10_12_0001.swi primary
The primary image will be deleted.

Continue (y/n)? y
The authenticity of host '192.10.12.0 (192.10.12.0)' can't be established.
ECDSA key fingerprint is SHA256:L64khLwlyLgXlARKRMiwcAAK8oRaQ8C0oWP+PkGBXHY.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.10.12.0' (ECDSA) to the list of known hosts.
swuser@192.10.12.0's password:
Connected to 192.10.12.0.
Fetching /users/swuser/ss.10.00.0002.swi to ss.10.00.0002.swi.dnld
/users/swuser/ss.10.00.0002.swi                  100%  179MB  25.6MB/s   00:07
Verifying and writing system firmware...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.12	The `hot-patch` parameter is supported on all platforms.
10.10	The `hot-patch` parameter is introduced on the 6300 series switches.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy secondary primary

`copy secondary primary`

Description

Copies the firmware image from the secondary to the primary location.

Examples

```
switch# copy secondary primary
The primary image will be deleted.

Continue (y/n)? y
Verifying and writing system firmware...
```

```
switch# copy sftp://stor@192.22.1.0/im-switch.swi primary vrf mgmt
The primary image will be deleted.

Continue (y/n)? y
The authenticity of host '192.22.1.0 (192.22.1.0)' can't be established.
ECDSA key fingerprint is SHA256:MyI1xbdKnehYut0NLfL69gDpNzCmZqBVvBaRR46m7o8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.22.1.0' (ECDSA) to the list of known hosts.
stor@192.22.1.0's password:
Connected to 192.22.1.0.
sftp> get c8d5b9f-topflite.swi c8d5b9f-topflite.swi.dnld
Fetching /home/dr/im-switch.swi to c8d5b9f-topflite.swi.dnld
/home/dr/im-switch.swi                100%  226MB  56.6MB/s   00:04

Verifying and writing system firmware...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy *<STORAGE-URL>*

`copy <STORAGE-URL> {hot-patch|primary|secondary}`

Description

Copies, verifies, and installs a hot-patch or firmware image from a USB storage device connected to the active management module.

Parameter	Description
<STORAGE-URL>	Specifies the name of the firmware file to copy from the storage device. Required. **USB format:** `usb:/<FILENAME>`
`{hot-patch|primary|secondary}`	Select a hot-patch image or a primary or secondary profile for receiving the copied firmware. **NOTE:** For more information about hot-patch, see hot-patch.

USB usage

To specify a file:

- In a USB storage device: **usb:/*a.txt***
- In a directory of a USB storage device: **usb:/*dir*/*a.txt***

Examples

```
switch# copy usb:/FL.10.12.0001-0002.patch
```

```
switch# copy usb:/FL.10.12.0001.swi primary
The primary image will be deleted.

Continue (y/n)? y

Verifying and writing system firmware...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.12	The `hot-patch` parameter is supported on all platforms.
10.10	The `hot-patch` parameter is introduced on the 6300 series switches.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

copy hot-patch

```
copy hot-patch <Word> {<REMOTE-URL>|<Storage-URL>} [vrf <VRF-NAME>]
```

Description

Copies a hot-patch from a switch to the specified remote URL or storage URL.

Parameter	Description
<Word>	Name of the hot-patch software to upload.
<REMOTE-URL>	Specifies the URL to receive the uploaded patch using SFTP or TFTP. For information on how to format the remote URL, see URL formatting for copy commands.
vrf *<VRF-NAME>*	[Optional] specify the VRF instance to use for upload.
<STORAGE-URL>	Specifies the name of the patch file to create on the USB storage device. Prefix the filename with **usb:/**, for example, **usb:/firmware_FL_10_12_0001-0002.patch.**

Examples

```
switch# copy hot-patch FL_10_12_0001-0002.patch tftp:172.21.18.170/FL_10_12_0001-
0002.patch vrf vrf1
```

Related Commands

Command	Description
copy <REMOTE-URL>	Downloads a hot-patch image from a TFTP or SFTP server.
hot-patch	Apply a hot-patch image or remove it from the switch.

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.12	Hot-patch is now supported on all platforms.
10.10	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

hot-patch

```
hot-patch apply|remove <name.patch>
no hot-patch apply <name.patch>
```

Description

Apply hot-patch software or remove it from the switch. The **no** form of the **hot-patch apply** command disables the hot-patch image, but does not remove it from the switch. Rebooting the system after disabling or removing the patch is not required.

Profile names	Description
`apply <name.patch>`	Apply the specified hot-patch image to a standalone switch or VSF stack. AOS-CX hot-patch software images can be obtained from Aruba customer support, and are identified with a **.patch** extension.
`remove <name.patch>`	Disables the hot-patch image and removes the patch from the switch. This removal will also disable the patch. Once removed, a hot-patch must be downloaded again in order to be applied.

Usage

A hot-patch can be downloaded from a remote server onto a switch then applied without rebooting the switch. When the hot-patch is disabled, the hot-patch will still remain on the system. The disabled hot-patch can be removed from the system without the need for a reboot of the system.

If a checkpoint configuration that does not contain a hot-patch is restored to a running configuration that does have a hot-patch, the patch is not deleted, it remains as not applied but is present in the device memory.

Examples

```
switch(config)# hot-patch apply FL_10_12_0001-0002.patch
```

Related Commands

Command	Description
`copy <REMOTE-URL>`	Downloads and installs a hot-patch image from a TFTP or SFTP server.
`copy hot-patch`	Copies a hot-patch software image from a switch to a specified remote URL or storage URL.

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.12	Hot-patch is now supported on all platforms.
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show hot-patch

```
show hot-patch [detail]
```

Parameter	Description
`detail`	Displays the detailed status of all hot-patches present on the system.

Description

the **show hot-patch** command displays the status of all hot-patches present on the system. The **show hot-patch detail** command displays detailed information for all hot patches present on the system.

Examples

```
switch# show hot-patch

Name                                Status
-----------------------             -------
FL_10_12_0001-0002.patch            Applied

switch# show hot-patch detail

Name                    : FL_10_12_0001-0002.patch
Status                  : Applied
Version                 : FL_10_12_0001-0002.patch
Compatible Version      : FL.10.12.0001
Issues Fixed            : CR1234, CR2345
Patch Date              : 2022-03-29 20:46:15 UTC
Patch ID                : ArubaOS-CX:FL.10.12.0001-sp1-256-gd457e868d39:202204142009
Patch SHA               : a40438d06a82e5fe7e30d457e868d39e8526185b
```

Related Commands

Command	Description
copy <REMOTE-URL>	Downloads a hot-patch image from a TFTP or SFTP server.
hot-patch	Apply a hot-patch image or remove it from the switch.

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.12	Command supported on all platforms.
10.10	Command introduced on 6300 Switch series.

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

Flow monitoring commands

diag-dump ipfix basic

```
diag-dump ipfix basic
```

Description

Displays diagnostic information for IPFIX.

Examples

```
diag-dump ipfix basic
==========================================================================
[Start] Feature ipfix Time : Tue Apr 11 02:23:03 2023
==========================================================================
--------------------------------------------------------------------------
[Start] Daemon ipfixd
--------------------------------------------------------------------------
- IPFIX Record Cache dump -
- IPFIX Record ipfix -

....

:- IPFIX Monitor v6ti completed -
- End of IPFIX Monitor Cache dump -
--------------------------------------------------------------------------
[End] Daemon ipfixd
```

```
-------------------------------------------------------------------------
-------------------------------------------------------------------------
[Start] Daemon ops-switchd
-------------------------------------------------------------------------
Key format: <traffic_type>_<coalescence_id>_<agent_id>_<asic_port>
Key                              TCAM Entry ID    Count
-------------------------------- ---------------- -----
1_1532781829_3_20                0xffff7c7e7a00   1
1_3217499901_1_12                0xffff91187580   1
1_3217499901_1_13                0xffff91183d80   1
1_3217499901_1_14                0xffff91186e80   1

....

-------------------------------------------------------------------------
[End] Daemon ops-switchd
-------------------------------------------------------------------------
=========================================================================
[End] Feature ipfix
=========================================================================
Diagnostic-dump captured for feature ipfix
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced on 6300, 6400, 8100 and 8360 Switch series.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	Manager (#)	Administrators or local user group members with execution rights for this command.

flow exporter

```
flow exporter <name>
  destination
    <hostname> [vrf vrfname]
    <ipaddr> [vrf vrfname]
    <ip6addr>  [vrf vrfname]
    type  traffic-insight
  no ..
```

Description

A flow exporter is the part of the IP Flow Information Export (IPFIX) feature that defines how a flow monitor exports flow reports. You can assign the same flow exporter configuration to more than one flow monitor. Each flow exporter includes a destination setting that identifies the device to which the flow reports are sent. 6300 and 6400 series support a maximum of sixteen flow monitors with a limit of two flow exporters that can be applied to a single flow monitor.

Parameter	Description
`<name>`	Name of the flow exporter, up to 64 characters.
`dscp <0-63>`	DSCP value to be used by the flow exporter. The default value is **0**.
`export-protocol ipfix`	Define an export protocol for the flow exporter.The default **ipfix** protocol is the only protocol currently available.
`description <description>`	A description of the flow exporter, up to 256 characters and spaces.
`destination  <hostname>|<IPaddr>|<ip6addr>`	The exporter sends flow records to this destination. The destination can be defined as a hostname, or an IPv4 or IPv6 IP address.
`   [vrf vrfname]`	You can optionally include the name of the destination VRF in the destination definition.
`destination type {hostname-or-ip-addr | traffic-insight}`	The exporter sends flow reports to a traffic insight destination.
`destination traffic-insight <name>`	The exporter sends flow reports to a specific traffic insight destination.
`no ..`	Negate any configured parameter.
`template data timeout <timeout>`	A flow exporter template describes the format of exported flow reports. Therefore, flow reports cannot be decoded properly without the corresponding templates. This setting defines how often the flow exporter will resend templates to the flow monitor. The supported range is 1-86400 seconds, and the default is 600 seconds.
`transport udp <port>`	Transport protocol and port for sending flow record reports. The default port is port 4739,

Examples

The following example creates a flow exporter configuration named **exporter-1**.

```
switch(config)# flow exporter exporter-1
switch(config-flow-exporter)# dscp 34
switch(config-flow-exporter)# destination 192.0.2.1 vrf VRF1
switch(config-flow-exporter)# template data timeout 1200
switch(config-flow-exporter)# description Exports flows to 192.0.2.1
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
`flow record`	Define data to be included in a flow record by configuring flow record match and collect fields
`flow monitor`	Define a flow monitor configuration, including the flow exporter and flow record associated to that monitor.
`show flow exporter`	Display flow exporter configuration and status.

Command History

Release	Modification
10.11	Command introduced on 6300, 6400, 8100 and 8360 Switch series.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config` `config-flow-exporter`	Administrators or local user group members with execution rights for this command.

flow monitor

```
flow monitor <name>
   exporter <name>
   cache timeout active|inactive <timeout>
   description <description>
   record <name>
```

Description

On a 6300 and 6400 Switch series, a flow monitor is the part of the IP Flow Information Export (IPFIX) feature that performs network monitoring for the selected interface. A flow monitor configuration consists of a flow record, a flow cache, and one or more associated flow exporters. A flow monitor compiles data from the network traffic on the interface and stores it in the flow cache in a format defined by the flow record. The flow exporters associated with the monitor then export data from the flow cache to the flow exporter destination.

6300 and 6400 series support a maximum of sixteen flow monitors with a limit of two flow exporters that can be applied to a single flow monitor. If no software augmentation of flows is required, there is no need to configure a flow collector or flow monitor.

Parameter	Description
`<name>`	Name of the flow monitor , up to 64 characters.
`cache timeout active|inactive <timeout>`	Use the cache timeout parameter to define an active or inactive timeout for the flow monitor. A flow monitor closes a flow session that is active for longer than the active timeout or inactive for longer than the inactive timeout. The supported timeout range for both the active timeout and inactive timeout is 30-120 seconds, and the default is 30 seconds.
`description`	A description up to 256 characters long, including spaces.
`exporter <name>`	Assign a flow exporter to a flow monitor. Each flow monitor supports a maximum of two different flow exporters, sending flow records to up to two destinations.
`record <name>`	) Assigns a flow record to a flow monitor.

Examples

The following example creates a flow monitor configuration named **monitor-1**.

```
switch(config)# flow monitor monitor-1
switch(config-flow-monitor)# description Monitor for analyzing basic ipv4 traffic
switch(config-flow-monitor)# exporter flow-exporter-1
switch(config-flow-monitor)# exporter flow-exporter-2
switch(config-flow-monitor)# record flow-record-1
switch(config-flow-monitor)# cache timeout inactive 120
switch(config-flow-monitor)# cache timeout active 1500
```

The following workflow changes the flow record assigned to a flow monitor.

```
switch(config)# flow monitor flow-monitor-1
switch(config-flow-monitor)# record flow-record-2
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
flow exporter	Define how a flow monitor exports the flow reports.
flow record	Define data to be included in a flow record by configuring flow record match and collect fields
show flow monitor	Displays flow monitor configuration and status

Command History

Release	Modification
10.11	Command introduced on 6400, 6400, 8200 and 8360 Switch series.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	config config-flow-monitor	Administrators or local user group members with execution rights for this command.

flow record

```
flow record <name>
   match
      ip|ipv6 {protocol|version}|{source|destination address}
      transport {source|destination} port
   collect
      application name
      application https url
      dns response-code
      counter {packets|bytes}
      timestamp absolute {first|last}
      description <description>
```

Description

Define data to be included in a flow record by configuring flow record match and collect fields.

A flow record defines match (key) fields and collection (non-key) fields. Customers configure flow records with **match** (key) fields and **collect** (non-key) fields. Match fields are the set of fields that define a flow, such as IP address or UDP port. Collect fields are the set of fields that identify information to collect for a flow, such as packet and byte counters.

Traffic with matching attributes (for example, traffic coming from the same interface, sent to the same destination with the same protocol) are classified as a single flow. Information for some or all of the matched settings can be collected and exported to a destination defined by the flow exporter assigned to the flow monitor.

Traffic must match a match rule definition before it can be collected and sent. You cannot collect and send data that is not matched.

Parameter	Description
`<name>`	Name of the flow monitor, up to 64 characters.
`match`	match traffic according to one or more of the following key attributes: - **ip**: match traffic on an IPv4 network - **ipv6**: match traffic on an IPv6 network - **protocol**: Match traffic using the same IP protocol - **version**: Match traffic using the same IP version - **source**: Match traffic from the same source - **destination**: Match traffic to the same destination - **address**: Match traffic by source or destination IP address - **transport**: Match traffic by source or destination transport type - **port**: Match traffic by source or destination transport port
`description`	A description for the flow record up to 256 characters long, including spaces.
`collect`	Configures data fields to be included a flow record. - **application name:** Specify the application name as a non-key field in a flow record. - **application https url**: Specify the HTTP/HTTPS application URL as a non-key field in a flow record. - **dns response-code**: Specify the DNS parameters and DNS response code as a non-key field in the flow record. - **counter packets**: Collect counter data for packets in the flow - **counter bytes**: Collect counter data for bytes in the flow - **timestamp absolute first**: Collect absolute timestamp of the first packet observed. - **timestamp absolute last**: Collect absolute timestamp of the last packet observed.

Examples

Adding IPv4 and transport match fields to **flow-record-1:**

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# match ip source address
switch(config-flow-record)# match ip destination address
switch(config-flow-record)# match ip protocol
switch(config-flow-record)# match ip version
switch(config-flow-record)# match transport source port
switch(config-flow-record)# match transport destination port
switch(config-flow-record)# description Record used for basic ipv4 traffic
analysis
```

Removing the IPv4 destination match field from the **flow-record-1**:

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# no match ip destination address
```

Adding counter and timestamp collect fields to **flow-record-1**:

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# collect counter packets
switch(config-flow-record)# collect counter bytes
switch(config-flow-record)# collect timestamp absolute first
switch(config-flow-record)# collect timestamp absolute last
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Add a application name to **flow record 1** as a collect field:

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# collect application name
switch(config-flow-record)# collect application https url
switch(config-flow-record)# collect application dns response-code
switch(config-flow-record)# collect application tls-attributes
```

Related Commands

Command	Description
flow exporter	Define how a flow monitor exports the flow reports.
flow monitor	Define a flow monitor configuration, including the flow exporter and flow record associated to that monitor.
show flow record	Display flow record configuration and status.

Command History

Release	Modification
10.14	The **ipv4** parameter is deprecated and replaced with **ip**.
10.13	Added **application https url** and **dns response-code** parameters.
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	config config-flow-record	Administrators or local user group members with execution rights for this command.

flow-tracking

```
flow-tracking
  enable
  icmp-ageout
  interface-flow-limit
```

```
no ...
tcp-ageout
track icmp
udp-ageout
```

Description

Configures flow tracking for TCP and UDP flows, and optionally, ICMP flows. The **no** form of this command deletes the flow tracking configuration context.

In order to optimize the flow removal process, flows that have aged-out are flushed in batches. A flow that has aged out is flushed only when the next batch processes. This can cause some flows to stay inactive for a slightly longer time than the value configured here.

Parameter	Description
`enable`	Enables flow tracking.
`icmp-ageout`	Configures an age-out time for ICMP flows, in seconds. Range: 10-86400. Default: 15.
`interface-flow-limit`	Configures global concurrent flow limit for flow tracking enabled interfaces. Range: 64-25000. Default: none.
`tcp-ageout`	Configures age-out time for established TCP flows in seconds. Range: 120-86400. Default: 600.
`track icmp`	Enable tracking of ICMP flows, in addition to the TCP/UDP flows tracked by default.
`udp-ageout`	Configures age-out time for established UDP flows in seconds. Range: 30-86400. Default: 30.

Examples

Configuring flow tracking:

```
switch(config)# flow-tracking
switch(config-flow-tracking)#
```

Deleting flow tracking:

```
switch(config)# no flow-tracking
switch(config)#
```

Enabling flow tracking:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# enable
```

Disabling flow tracking:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# no enable
```

Configuring an established ICMP flow age-out to 600 seconds:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# icmp-ageout 600
```

Removing an established ICMP flow age-out of 600 seconds:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# no icmp-ageout 600
```

Configuring an established TCP flow age-out to 1000 seconds:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# tcp-ageout 1000
```

Removing an established TCP flow age-out of 1000 seconds:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# no tcp-ageout 1000
```

Configuring an established UDP flow age-out to 1000 seconds:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# udp-ageout 1000
```

Removing an established UDP flow age-out of 1000 seconds:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# no udp-ageout 1000
```

Configuring global level interface flow limit to 256 interfaces:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# interface-flow-limit 256
```

Removing global level interface flow limit to 256 interfaces:

```
switch(config)# flow-tracking
switch(config-flow-tracking)# no interface-flow-limit 256
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
`IP source lockdown resource extended`	**no ip source-lockdown resource-extended** must be disabled to enable **flow-tracking**

Command History

Release	Modification
10.14	The **track icmp** parameter is introduced.
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config`	Administrators or local user group members with execution rights for this command.

ipv4|ipv6 flow monitor (interface)

```
[no] ip|ipv6 flow monitor <name> in
```

Description

Enable flow monitoring on inbound and outbound interfaces by assigning a flow monitor to that interface. Only physical interfaces and LAG interfaces can be monitored. A flow monitor cannot be applied to an interface that is part of a LAG. If an unsupported application is attempted, an error message will be displayed. If the flow monitor is associated with a flow record that contains application fields as collect fields, then Application Recognition should be enabled on the same interface.

The **[no]** form of command disables the flow monitoring.

Examples

Associate a flow monitor configuration named **flow-monitor-1** and **flow-monitor-2** for IPv4 or IPv6 traffic respectively on physical interface.

```
switch(config)# interface 1/1/1
switch(config-if)# ip flow monitor flow-monitor-1 in
switch(config-if)# ipv6 flow monitor flow-monitor-2 in
```

Associate a flow monitor configuration named **flow-monitor-3** and **flow-monitor-4** for IPv4 or IPv6 traffic respectively on a Lag interface.

```
switch(config)# interface lag 1
switch(config-lag-if)# ip flow monitor flow-monitor-3 in
switch(config-lag-if)# ipv6 flow monitor flow-monitor-4 in
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
flow exporter	Define how a flow monitor exports the flow reports.
flow record	Define data to be included in a flow record by configuring flow record match and collect fields
flow monitor	Define a flow monitor configuration, including the flow exporter and flow record associated to that monitor.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config` `config-flow-monitor`	Administrators or local user group members with execution rights for this command.

show flow exporter

```
show flow exporter [<name>] [statistics]
```

Description

Displays flow exporter statistics, configuration and status. When no exporter name is specified, the output of this command displays information for all flow exporters.

The output of this command can indicate the following status types:

- Accepted
- Rejected (Internal error: exporter does not exist)
- Rejected (Internal error: destination type does not exist)
- Rejected (Destination type is hostname or IP address, but no destination is specified)
- Rejected (Destination type is hostname or IP address, but the specified hostname or IP address is invalid)
- Rejected (Destination type is Traffic Insight, but no destination is specified)
- Rejected (Destination type is Traffic Insight, but the specified Traffic Insight instance does not exist)
- Rejected (Destination type is Traffic Insight, but the specified Traffic Insight instance is not enabled)
- Rejected (Destination type is Traffic Insight, but the specified Traffic Insight instance source is not IPFIX)
- Rejected (Internal error: destination type is Traffic Insight, but the specified Traffic Insight instance is invalid)

Parameter	Description
`<name>`	Name of the flow exporter.
`statistics`	The `statistics` parameter adds statistical information about the flow exporter to the output.

Examples

Display the configuration of a flow exporter named **exporter-1**.

```
switch# show flow exporter exporter-1
--------------------------------------------------------------------------------
Flow exporter 'exporter-1'
--------------------------------------------------------------------------------
Description              : Exports to the first collector
Status                   : Accepted
Export Protocol          : ipfix
Destination Type         : Hostname or IP address
Destination              : 192.168.0.1
Transport Configuration
    Protocol             : UDP
    Port                 : 9995
```

Display statistics information for all flow exporters

```
switch# show flow exporter exporter-1 statistics

--------------------------------------------------------------------------------
Flow exporter 'exporter-1'
--------------------------------------------------------------------------------
Reports sent             : 14961
--------------------------------------------------------------------------------
Flow exporter 'exporter-2'
--------------------------------------------------------------------------------
Reports sent             : 5
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
`flow exporter`	Define how a flow monitor exports the flow reports.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config` `config-flow-exporter`	Administrators or local user group members with execution rights for this command.

show flow monitor

`show flow monitor [<name>]`

Description

Displays flow monitor configuration and status. When no monitor name is specified, the output of this command displays information for all flow monitors.

The output of this command can indicate the following status types:

- Accepted
- Rejected (Internal error: monitor does not exist)
- Rejected (The state of one or more of the assigned flow exporters is rejected)

Parameter	Description
`<name>`	Name of the flow monitor.

Examples

Display the configuration of a flow moitor named **flow-monitor-1**.

```
switch# show flow monitor monitor-1
--------------------------------------------------------------------------------
Flow monitor 'monitor-1'
--------------------------------------------------------------------------------
Description              : Used for IPv4 traffic analysis
Status                   : Accepted
Flow Exporter(s)         : exporter-1, exporter-2
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
`flow monitor`	Define a flow monitor configuration, including the flow exporter and flow associated to that monitor.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config` `config-flow-exporter`	Administrators or local user group members with execution rights for this command.

show flow record

`show flow record [<name>]`

Description

Display flow record configuration and status. When no record name is specified, the output of this command displays information for all flow records.

The output of this command can indicate the following status types:

- Accepted
- Rejected (Internal error: failed to process record)
- Rejected (Mix of IPv4 and IPv6 match fields is not allowed. Specify match fields of the same IP version (IPv4 or IPv6))

Parameter	Description
`<name>`	Name of the flow record.

Examples

Display the configuration of a flow record named **flow-record-1**.

```
switch# show flow record record-1
--------------------------------------------------------------------------------
Flow record  'record-1'
--------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Match Fields
    ipv4 destination address
    ipv4 protocol
    ipv4 source address
    ipv4 version
    transport destination port
    transport source port
Collect Fields
    application name
    counter bytes
    counter packets
```

Display the information of a specific flow record.

```
switch# show flow record record-1
--------------------------------------------------------------------------------
Flow record  'record-1'
--------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Match Fields
    ipv4 destination address
    ipv4 protocol
    ipv4 source address
    ipv4 version
    transport destination port
    transport source port
Collect Fields
    application name
    counter bytes
    counter packets
```

Display information for all flow records

```
switch# show flow record
--------------------------------------------------------------------------------
Flow record  'record-1'
--------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Match Fields
        ipv4 destination address
        ipv4 protocol
        ipv4 source address
        ipv4 version
        transport destination port
        transport source port
Collect Fields
        application name
        counter bytes
        counter packets
--------------------------------------------------------------------------------
Flow record  'record-2'
--------------------------------------------------------------------------------
Description             : Used for IPv6 traffic analysis
Status                  : Accepted
Match Fields
        ipv6 destination address
        ipv6 protocol
        ipv6 source address
        ipv6 version
        transport destination port
        transport source port
Collect Fields
        application name
        counter bytes
        counter packets
```

~~~~
```
~~~~

Display information with no flow records configured

```
switch# show flow record
No flow records configured
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
`flow record`	Define data to be included in a flow record by configuring flow record match and collect fields

Command History

Release	Modification
10.11	Command introduced on 6400, 6400, 8100, and 8360 Switch series.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config` `config-flow-exporter`	Administrators or local user group members with execution rights for this command.

show flow-tracking

`show flow-tracking`

Description

Displays flow-tracking and statistics collection configurations and status.

Examples

Display the configuration of role based flow tracking.

```
switch(config)# show flow-tracking
Flow Tracking Global Configuration
Configuration status             : Enabled
Operational status               : Enabled
```

```
Failure Reason                  : NA
UDP Ageout                      : 30   (Seconds)
TCP Ageout                      : 600  (Seconds)
ICMP Ageout                     : 15   (Seconds)
Interface Flow limit            : None
Tracked Protocols               : TCP, UDP
Statistics Collection
   Configuration Status         : Enabled
   Operational Status           : Enabled
   Failure Reason               : NA
Flow Tracking Port Configuration
Interface       App Recognition    Reflexive ACL         IPFIX         Operation
Status
-----------     -----------       ----------------      ----------       ---------
-
1/1/1              Enabled             Disabled           Enabled          Enabled
1/1/2              Enabled             Disabled           Disabled         Enabled
1/1/3              Enabled             Disabled           Disabled         Enabled
1/1/4              Enabled             Disabled           Disabled         Enabled
1/1/5              Enabled             Disabled           Disabled         Enabled
1/1/6              Enabled             Disabled           Disabled         Enabled
1/1/7              Enabled             Disabled           Enabled          Enabled
1/1/8              Enabled             Disabled           Disabled         Enabled
1/1/9              Enabled             Disabled           Disabled         Enabled
1/1/10             Disabled            Disabled           Disabled
Disabled
1/1/13             Enabled             Disabled           Enabled          Enabled
1/1/14             Enabled             Disabled           Disabled         Enabled
1/1/15             Enabled             Disabled           Disabled         Enabled
1/1/16             Enabled             Disabled           Disabled         Enabled
1/1/17             Enabled             Disabled           Disabled         Enabled
1/1/18             Enabled             Disabled           Disabled         Enabled
1/1/19             Enabled             Disabled           Disabled         Enabled
1/1/20             Enabled             Disabled           Disabled         Enabled
1/1/21             Enabled             Disabled           Disabled         Enabled
1/1/23             Enabled             Disabled           Disabled         Enabled
1/1/24             Enabled             Disabled           Enabled          Enabled
1/1/28             Disabled            Disabled           Disabled
Disabled
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Related Commands

Command	Description
IP source lockdown resource extended	**IP source lockdown** must be disabled with the **no ip source-lockdown resource-extended** command before enabling flow-tracking

Command History

Release	Modification
10.14	Added information related to role based IPFIX.
10.14	The output of this command includes ICMP ageout information.
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config`	Administrators or local user group members with execution rights for this command.

show tech ipfix

`show tech ipfix`

Description

Shows the IPFIX configuration settings.

If applicable source IP address or source interface is configured for the IPFIX protocol, that configuration is used.

If a valid source is configured, the exporter sends flows to an external collector using the effective configured source IP address as the source IP address of the flow packets. In the context of this application, a valid source IP address is any IP address configured in the exporter's VRF namespace.

Examples

The example shows the IPFIX configuration settings.

```
switch#show tech ipfix
====================================================
Show Tech executed on Tue Apr 11 02:43:06 2023
====================================================
====================================================
[Begin] Feature ipfix
====================================================
*********************************
Command : show flow exporter
*********************************
--------------------------------------------------------------------------------
Flow exporter 'ipfix'
--------------------------------------------------------------------------------
Status                  : Accepted
Export Protocol         : ipfix
Destination Type        : Traffic Insight
Destination             : t1
Transport Configuration
Protocol            : udp
Port                : 4739
--------------------------------------------------------------------------------
Flow exporter 'V6E1'
--------------------------------------------------------------------------------
```

```
....

=====================================================
[End] Feature ipfix
=====================================================
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced on 6400, 6400, 8100, and 8360 Switch series.

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	Manager (#)	Administrators or local user group members with execution rights for this command.

Chapter 44

Group based policy commands

class gbp-ip

```
[no] class gbp-ip <CLASS-NAME>

    [no][<SEQUENCE-NUMBER>]
        {match | ignore}
        {any | <SRC-ROLE-NAME> | default}
        {any | <DST-ROLE-NAME>}
        [count]

    [no][<SEQUENCE-NUMBER>]
        {match | ignore}
        {sctp | tcp | udp}
        {any | <SRC-ROLE-NAME> | default}
        [{eq | gt | lt} <PORT-NUMBER> | range <MIN-PORT> <MAX-PORT>]
        {any | <DST-ROLE-NAME>}
        [{eq | gt | lt} <PORT-NUMBER> | range <MIN-PORT> <MAX-PORT>]
        [count]

    [no][<SEQUENCE-NUMBER>]
        {match | ignore}
        {icmp}
        {any | <SRC-ROLE-NAME> | default}
        {any | <DST-ROLE-NAME>}
        [icmp-type {echo | echo-reply | <ICMP-TYPE-VALUE>}] [icmp-code <ICMP-CODE-VALUE>]
        [count]

   [no] [<SEQUENCE-NUMBER>]
        {match | ignore}
        {any | tcp | udp | icmp}
        {any | <SRC-ROLE-NAME> | default | infra| internet| intranet}
        {<DST-ROLE-NAME>}
        [app-category {any | <APP-CATEGORY-NAME>} app {any | <APP-NAME>}]
        [count]

   [no] [<SEQUENCE-NUMBER>] comment <TEXT-STRING>

   [no] class gbp-ip <CLASS-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>

   [no] class gbp-ip <CLASS-NAME> copy <DESTINATION-CLASS>
```

Description

Creates, deletes, or modifies an IPv4 Group-Based Policy (GBP) class to match specified protocol packets. A class consists of one or more class entries ordered and prioritized by sequence numbers. Each class can classify traffic based on IPv4 protocol header information.

The **no** keyword deletes either a class or an individual class entry.

Usage

- Entering an existing **<CLASS-NAME>** value modifies the existing class.
- Any new **<SEQUENCE-NUMBER>** value creates an additional class entry.
- Any existing **<SEQUENCE-NUMBER>** value replaces the existing class entry with the same sequence number.
- If no sequence number is specified, a new class entry will be appended with a sequence number equal to the highest policy entry currently in the list plus 10.
- Copying a class to an existing class overwrites the existing entries with new entries.
- Removing a GBP class with entries removes all its entries as well. If a GBP class, that is currently associated with a GBP policy, is attempted to be removed, then a warning message is presented to remove the association before removing the class.
- You can reorder the sequence numbers with the **class resequence** command.
- You can also create redundant class entries in a class that have the same match criteria and action. However, each redundant copy of the class entry will consume additional resources.

Parameter	Description
<CLASS-NAME>	Specifies the class name.
<SEQUENCE-NUMBER>	Specifies the class entry sequence number. Range: `1` to `4294967295`.
{match | ignore}	Creates a rule to ignore or match specified IPv4 packets.
<SRC-ROLE-NAME>	Specifies the source role name.
<DST-ROLE-NAME>	Specifies the destination role name.
<PORT-NUMBER>	Specifies the layer 4 port number. Range: `0` to `65535`.
<MIN-PORT>	Specifies the start port number in the range. Range: `0` to `65535`.
<MAX-PORT>	Specifies the end port number in the range. Range: `0` to `65535`.
<ICMP-TYPE-VALUE>	Specifies a valid ICMP type number. Range: `0` to `255`.
<ICMP-CODE-VALUE>	Specifies a valid ICMP code number. Range: `0` to `255`.
<app-category-name>	(For 6300 and 6400 Switch series) Application-based policies can be applied to any of the following application types: ■ antivirus— Antivirus updates ■ any— Matches all recognized flows irrespective of their application id ■ authentication— Protocol used for authentification purposes ■ behavioral— Protocol classified by non-deterministic criteria based on statistical analysis of packet form and session behavior ■ cloud-file-storage— Cloud File Storage related applications ■ collaboration— Collaboration applications ■ encrypted— Encryption protocol applications

Parameter	Description
	■ enterprise-apps—Enterprise applications ■ gaming—Gaming protocol and applications ■ im-file-transfer— IM File Transfer application category ■ instant-messaging— Instant Messaging applications ■ mail-protocols— Email exchange protocol ■ mobile—Mobile applications ■ mobile-app-store—Mobile app store and applications ■ network-service—Low level network protocol and applications ■ peer-to-peer—Peer-to-Peer applications ■ social-networking—Social Networking applications ■ standard— Standard applications ■ streaming— Streaming applications ■ thin-client—Remote control protocol and applications ■ tunneling— Tunneling protocol and applications ■ unified-communications—Unified Communication protocols and applications ■ unknown—Unknown applications ■ web—Generic web traffic ■ webmail— Web email applications
<app-name>	(For 6300 and 6400 Switch series) Configure a class for the specified application. **NOTE:** The app **<unknown>** under the app-category **<standard>** matches all recognized flows whose application id is unknown or unmapped.

Examples

Creating a group based policy IPv4 class with three entries:

```
switch(config)# class gbp-ip my_gbp_ip_class
switch(config-class-gbp-ip)# 1 match icmp any any
switch(config-class-gbp-ip)# 2 ignore udp default any
switch(config-class-gbp-ip)# 3 match tcp guest admin
switch(config-class-gbp-ip)# 4 count
```

Adding a comment to an existing GBP IPv4 class entry:

```
switch(config)# class gbp-ip my_gbp_ip_class
switch(config-class-gbp-ip)# 3 comment mygbpipClass
```

Removing a comment from an existing class entry:

```
switch(config)# class gbp-ip my_gbp_ip_class
switch(config-class-gbp-ip)# no 3 comment
```

Replacing an IPv4 class entry in an existing GBP IPv4 class:

```
switch(config)# class gbp-ip my_gbp_ip_class
switch(config-class-gbp-ip)# 1 match igmp any any
```

Resequencing a GBP IPv4 class:

```
switch(config)# class gbp-ip my_gbp_ip_class resequence 1 10
```

Removing a GBP IPv4 class entry:

```
switch(config)# class gbp-ip my_gbp_ip_class
switch(config-class-gbp-ip)# no 1
```

Copying a GBP class entries from the source to the destination:

```
switch(config)# class gbp-ip my_gbp_ip_class copy my_gbp_ip_class2
```

Removing a GBP IPv4 class:

```
switch(config)# no class gbp-ip my_gbp_ip_class
```

Configuring a GBP policy that allows an SSH connection from **employee** to **admin** but denies telnet and any other applications.

For more information on configuring a port-access GBP policy, refer to port-access gbp

```
class gbp-ip class-ssh
   10 match any employee admin app-category any app ssh count
class gbp-ip class-telnet
   10 match any employee admin app-category any app telnet count
class gbp-ip class-any-any
   10 match any employee admin app-category any app any count
class gbp-ip class-network-service
   10 match any employee admin app-category network-service app any count
class gbp-ip explicit-allow-for-app-rec
   10 match any employee admin
port-access gbp policy
   10 class gbp-ip class-ssh
   20 class gbp-ip class-telnet action drop
   30 class gbp-ip class-any-any action drop
   40 class gbp-ip explicit-allow-for-app-rec
```

NOTE: Class entry with sequence number 40 is required to enable application recognition for any flow that is not assigned an application ID yet. Once the application ID is assigned, subsequent packets from the flow will match the corresponding app based entry in the policy (if one is configured).

Configuring a GBP policy that denies telnet connections from **employee** to **admin** but allows SSH and other applications.

```
port-access gbp policy
   10 class gbp-ip class-ssh
   20 class gbp-ip class-telnet action drop
   40 class gbp-ip explicit-allow-for-app-rec
```

NOTE: In this example, a class entry with sequence number **40** is required to enable application recognition for any flow that is not assigned an application ID yet. Once the application ID is assigned, subsequent telnet flows will match entry 20 and be dropped while SSH and other applications will match entry **10** and **40** respectively. Entry **40** in this example will also match flows that have the application recognized and are not SSH or telnet.

OR

```
port-access gbp policy
10 class gbp-ip class-ssh
20 class gbp-ip class-telnet action drop
30 class gbp-ip class-any-any
40 class gbp-ip explicit-allow-for-app-rec
```

NOTE: In this case, an explicit entry, **30**, is added for allowing flows from any apps that are not SSH or telnet. Entry 40 will only be used when an application is yet to be recognised for a flow.

Configuring a GBP policy that denies telnet connections from **employee** to **admin** but allows SSH and other applications in the **network service** category.

```
port-access gbp policy
 10 class gbp-ip class-ssh
 20 class gbp-ip class-telnet action drop
 30 class gbp-ip class-network-service
 40 class gbp-ip explicit-allow-for-app-rec
```

Configuring a GBP policy that allows telnet connection from employee to admin but denies all other apps in the network service category.

```
 port-access gbp policy
  20 class gbp-ip class-telnet
  30 class gbp-ip class-network-service action drop
  40 class gbp-ip explicit-allow-for-app-rec
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.14	Added support for application-based roles for the 6300 and 6400 switch series
10.08	Command introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

class gbp-ipv6

```
class gbp-ipv6 <CLASS-NAME>
   [no][<SEQUENCE-NUMBER>]
        {match | ignore}
        {any | <SRC-ROLE-NAME> | default}
        {any | <DST-ROLE-NAME>}
        [count]

    [no][<SEQUENCE-NUMBER>]
        {match | ignore}
        {sctp | tcp | udp}
        {any | <SRC-ROLE-NAME> | default}
        [{eq | gt | lt} <PORT-NUMBER> | range <MIN-PORT> <MAX-PORT>]
        {any | <DST-ROLE-NAME>}
        [{eq | gt | lt} <PORT-NUMBER> | range <MIN-PORT> <MAX-PORT>]
        [count]

    [no][<SEQUENCE-NUMBER>]
        {match | ignore}
        {icmpv6}
        {any | <SRC-ROLE-NAME> | default}
        {any | <DST-ROLE-NAME>}
        [icmp-type {echo | echo-reply | <ICMP-TYPE-VALUE>}] [icmp-code <ICMP-CODE-VALUE>]
        [count]

  [no]class gbp-ipv6 <CLASS-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>

  [no] class gbp-ipv6 <CLASS-NAME> copy <DESTINATION-CLASS>
```

Description

Creates, deletes, or modifies an IPv6 Group-Based Policy (GBP) class to match specified protocol packets.. A class consists of one or more class entries ordered and prioritized by sequence numbers. Each class can classify traffic based on IPv6 protocol header information.

The **no** keyword deletes either a class or an individual class entry.

Usage

- Entering an existing **<CLASS-NAME>** value modifies the existing class.
- Any new **<SEQUENCE-NUMBER>** value creates an additional class entry.
- Any existing **<SEQUENCE-NUMBER>** value replaces the existing class entry with the same sequence number.
- If no sequence number is specified, a new class entry will be appended with a sequence number equal to the highest policy entry currently in the list plus 10.
- Copying a class to an existing class overwrites the existing entries with new entries.

- Removing a GBP class with entries removes all its entries as well. If a GBP class, that is currently associated with a GBP policy, is attempted to be removed, then a warning message is presented to remove the association before removing the class.
- You can reorder the sequence numbers with the **class resequence** command.
- You can also create redundant class entries in a class that have the same match criteria and action. However, each redundant copy of the class entry will consume additional resources.

Parameter	Description
<CLASS-NAME>	Specifies the class name.
<SEQUENCE-NUMBER>	Specifies the class entry sequence number. Range: `1` to `4294967295`.
{match | ignore}	Creates a rule to ignore or match specified IPv6 packets.
<SRC-ROLE-NAME>	Specifies the source role name.
<DST-ROLE-NAME>	Specifies the destination role name.
<PORT-NUMBER>	Specifies the layer 4 port number. Range: `0` to `65535`.
<MIN-PORT>	Specifies the start port number in the range. Range: `0` to `65535`.
<MAX-PORT>	Specifies the end port number in the range. Range: `0` to `65535`.
<ICMP-TYPE-VALUE>	Specifies a valid ICMP type number. Range: `0` to `255`.
<ICMP-CODE-VALUE>	Specifies a valid ICMP code number. Range: `0` to `255`.
<app-category-name>	(For 6300 and 6400 Switch series) Application-based policies can be applied to any of the following application types: ■ antivirus— Antivirus updates ■ any— Matches all recognized flows irrespective of their application id ■ authentication— Protocol used for authentification purposes ■ behavioral— Protocol classified by non-deterministic criteria based on statistical analysis of packet form and session behavior ■ cloud-file-storage— Cloud File Storage related applications ■ collaboration— Collaboration applications ■ encrypted— Encryption protocol applications ■ enterprise-apps—Enterprise applications ■ gaming—Gaming protocol and applications ■ im-file-transfer— IM File Transfer application category ■ instant-messaging— Instant Messaging applications ■ mail-protocols— Email exchange protocol ■ mobile—Mobile applications ■ mobile-app-store—Mobile app store and applications ■ network-service—Low level network protocol and applications

Parameter	Description
	- peer-to-peer—Peer-to-Peer applications - social-networking—Social Networking applications - standard— Standard applications - streaming— Streaming applications - thin-client—Remote control protocol and applications - tunneling— Tunneling protocol and applications - unified-communications—Unified Communication protocols and applications - unknown—Unknown applications - web—Generic web traffic - webmail— Web email applications
<app-name>	(For 6300 and 6400 Switch series) Configure a class for the specified application. **NOTE:** The app **<unknown>** under the app-category **<standard>** matches all recognized flows whose application id is unknown or unmapped.

Examples

Creating a group based policy IPv6 class with three entries:

```
switch(config)# class gbp-ipv6 my_gbp_ipv6_class
switch(config-class-gbp-ipv6)# 10 match icmpv6 any any
switch(config-class-gbp-ipv6)# 20 ignore udp default any
```

Adding a comment to an existing GBP IPv6 class entry:

```
switch(config)# class gbp-ipv6 my_gbp_ipv6_class
switch(config-class-gbp-ipv6)# 10 match icmpv6 any any
switch(config-class-gbp-ipv6)# 20 ignore udp default any
switch(config-class-gbp-ipv6)# 20 comment myipv6Class
```

Removing a comment from an existing class entry:

```
switch(config)# class gbp-ipv6 my_gbp_ipv6_class
switch(config-class-gbp-ipv6)# no 20 comment
```

Replacing an IPv6 class entry in an existing GBP IPv6 class:

```
switch(config)# class gbp-ipv6 my_gbp_ipv6_class
switch(config-class-gbp-ipv6)# 10 match any any admin
```

Resequencing a GBP IPv6 class:

```
switch(config)# class gbp-ipv6 my_gbp_ipv6_class resequence 1 1
```

Removing a GBP IPv6 class entry:

```
switch(config)# class gbp-ipv6 my_gbp_ipv6_class
switch(config-class-gbp-ipv6)# no 1
```

Copying a GBP class entries from the source to the destination:

```
switch(config)# class gbp-ipv6 my_gbp_ipv6_class copy my_gbp_ipv6_class2
```

Removing a GBP IPv6 class:

```
switch(config)# no class gbp-ipv6 my_gbp_ipv6_class
```

Configuring a GBP policy that allows an SSH connection from **employee** to **admin** but denies telnet and any other applications.

For more information on configuring a port-access GBP policy, refer to port-access gbp

```
class gbp-ipv6 class-ssh
   10 match any employee admin app-category any app ssh count
class gbp-ipv6 class-telnet
   10 match any employee admin app-category any app telnet count
class gbp-ipv6 class-any-any
   10 match any employee admin app-category any app any count
class gbp-ipv6 class-network-service
   10 match any employee admin app-category network-service app any count
class gbp-ipv6 explicit-allow-for-app-rec
   10 match any employee admin
port-access gbp policy
   10 class gbp-ipv6 class-ssh
   20 class gbp-ipv6 class-telnet action drop
   30 class gbp-ipv6 class-any-any action drop
   40 class gbp-ipv6 explicit-allow-for-app-rec
```

NOTE: Class entry with sequence number 40 is required to enable application recognition for any flow that is not assigned an application ID yet. Once the application ID is assigned, subsequent packets from the flow will match the corresponding app based entry in the policy (if one is configured).

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.14	Added support for application-based roles for the 6300 and 6400 switch series
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	config config-class-*<CLASS-TYPE>*	Administrators or local user group members with execution rights for this command.

class gbp-mac

```
class gbp-mac <CLASS-NAME>
      [<SEQUENCE-NUMBER>]
      {match | ignore}
      {any | <SRC-ROLE-NAME> | default}
      {any | <DST-ROLE-NAME>}
      {any | aarp | appletalk | arp | fcoe | fcoe-init | ip | ipv6 | ipx-arpa | ipx-non-
      arpa |is-is | lldp | mpls-multicast | mpls-unicast | q-in-q | rbridge | trill |wake-
      on-lan | <NUMERIC-ETHERTYPE>}
      [count]

[<SEQUENCE-NUMBER>] comment <TEXT-STRING>

class gbp-mac <CLASS-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>

class gbp-mac <CLASS-NAME> copy <DESTINATION-CLASS>

no class gbp-mac <CLASS-NAME>
   no [<SEQUENCE-NUMBER>]
      {match | ignore}
      {any | <SRC-ROLE-NAME> | default}
      {any | <DST-ROLE-NAME>}
      {any | aarp | appletalk | arp | fcoe | fcoe-init | ip | ipv6 | ipx-arpa | ipx-non-
      arpa |is-is | lldp | mpls-multicast | mpls-unicast | q-in-q | rbridge | trill |wake-
      on-lan | <NUMERIC-ETHERTYPE>}[
      count]
   no [<SEQUENCE-NUMBER>] comment <TEXT-STRING>
```

Description

Creates, deletes, or modifies class to match specified protocol packets. A class consists of one or more class entries ordered and prioritized by sequence numbers. Each class can classify traffic based on MAC information.

The **no** keyword deletes either a class or an individual class entry.

Usage

- Entering an existing **<CLASS-NAME>** value modifies the existing class.
- Any new **<SEQUENCE-NUMBER>** value creates an additional class entry.
- Any existing **<SEQUENCE-NUMBER>** value replaces the existing class entry with the same sequence number.
- If no sequence number is specified, a new class entry will be appended with a sequence number equal to the highest policy entry currently in the list plus 10.
- Copying a class to an existing class overwrites the existing entries with new entries.
- Removing a GBP class with entries removes all its entries as well. If a GBP class, that is currently associated with a GBP policy, is attempted to be removed, then a warning message is presented to remove the association before removing the class.
- You can reorder the sequence numbers with the **class resequence** command.

- You can also create redundant class entries in a class that have the same match criteria and action. However, each redundant copy of the class entry will consume additional resources.

Parameter	Description
<CLASS-NAME>	Specifies the class name.
<SEQUENCE-NUMBER>	Specifies the class entry sequence number. Range: `1` to `4294967295`.
{match | ignore}	Creates a rule to ignore or match specified packets.
<SRC-ROLE-NAME>	Specifies the source role name.
<DST-ROLE-NAME>	Specifies the destination role name.
<NUMERIC-ETHERTYPE>	Specifies the EtherType number. Range: `0x600` to `0xffff`.

Examples

Creating a GBP MAC class with three entries:

```
switch(config)# class gbp-mac my_gbp_mac_class
switch(config-class-gbp-mac)# 1 match any any lldp
switch(config-class-gbp-mac)# 2 ignore default any arp
```

Adding a comment to an existing GBP MAC class entry:

```
switch(config)# class gbp-mac my_gbp_mac_class
switch(config-class-gbp-mac)# 10 comment myGbpMacClass
```

Removing a comment from an existing class entry:

```
switch(config)# class gbp-mac my_gbp_mac_class
switch(config-class-gbp-mac)# no 10 comment myGbpMacClass
```

Replacing a MAC class entry in an existing GBP MAC class:

```
switch(config)# class gbp-mac my_gbp_mac_class
switch(config-class-gbp-mac)# 10 match any any any
```

Resequencing a GBP MAC class:

```
switch(config)# class gbp-mac my_gbp_mac_class resequence 1 1
```

Removing a GBP MAC class entry:

```
switch(config)# class gbp-mac my_gbp_mac_class
switch(config-class-gbp-mac)# no 1
```

Copying a GBP class entries from the source to the destination:

```
switch(config)# class gbp-mac my_gbp_mac_class copy my_gbp_mac_class2
```

Removing a GBP MAC class:

```
switch(config)# no class gbp-mac my_gbp_mac_class
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	config config-class-*<CLASS-TYPE>*	Administrators or local user group members with execution rights for this command.

clear port-access gbp hitcounts

```
clear port-access gbp [<POLICY-NAME>] hitcounts {client}
```

Description

Clears the statistics of the group based policy applied on the client.

Parameter	Description
<TLV-NUMBER>	Specifies the CDP TLV number. Supported values are 1 to 6, 10, and 11.

Examples

Clearing statistics of GBP applied on the client:

```
switch(config)# clear port-access gbp policy01 hitcounts {client}
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

gbp enable

```
gbp enable
no gbp enable
```

Description

Enables group based policy (GBP).

The **no** form of this command disables group based policy (GBP).

Examples

Enabling group based policy:

```
switch(config)# gbp enable
```

Disabling group based policy:

```
switch(config)# no gbp enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

gbp role

```
gbp role <ROLE_NAME> <ROLE_ID>
```

```
no gbp role <ROLE_NAME> <ROLE_ID>
```

Description

Maps the role name to the role ID. This mapping is used in the GBP encapsulation.

Starting from 10.13, for 6300 and 6400 switch series, new default roles, internet and intranet are introduced to differentiate traffic from different fabrics or networks. It is necessary to ensure that the reserved system role names are available before upgrading to AOS-CX 10.13. Any existing user defined system roles that use the role names, internet and intranet should be removed and reconfigured with a different role name.

The **no** form of this command removes the mapping between the role name and ID.

Parameter	Description
<ROLE_NAME>	Specifies the role name to be mapped.
<ROLE_ID>	Specifies the role ID. Range: 100 to 8191.

Examples

Mapping the **employee** role to the role ID **130**:

```
switch(config)# gbp role employee 130
```

Removing the mapping for the role **employee**:

```
switch(config)# no gbp role employee 130
```

The following error message is displayed when user attempts to delete a GBP role which is used inside a policy:

```
switch(config)# no gbp role finance
Role 'finance' is present inside a class. Deletion of role mapping will impact the
traffic flow.
Do you want to continue (y/n)? y
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

gbp role infra

```
gbp role infra <TAG-VALUE>
no gbp role infra [<TAG-VALUE>]
```

Description

Sets the GBP infra (infrastructure) role tag value for CPU-generated packets. Prior to AOS-CX 10.09, CPU generated traffic and non-secure port traffic was tagged with a default tag of 0.

This does not apply to CPU re-forwarded packets (DHCP snooping (v4, v6), ND snooping, RA guard, captive portal, IGMP, MLD, and mDNS).

The **no** form of this command resets the GBP infra tag value to its default of 2.

The same GBP infra role tag value must be used across the VXLAN network fabric.

Parameter	Description
<TAG-VALUE>	Specifies the infra tag value to use for CPU-generated packets. Range: 1 to 8191. Default: 2.

Examples

Setting the GBP infra tag value to 10:

```
switch(config)# gbp role infra 10
```

Resetting the GBP infra tag value to its default of 2:

```
switch(config)# no gbp role infra
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

port-access gbp

```
port-access gbp <POLICY-NAME>
         [<SEQUENCE-NUMBER>]
         class {gbp-ip | gbp-ipv6 | gbp-mac} <CLASS-NAME> [action {drop | reflect}]
         [<SEQUENCE-NUMBER>] comment <TEXT-STRING>

port-access gbp <POLICY-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>
port-access gbp <POLICY-NAME> copy <DESTINATION-POLICY>
port-access gbp <POLICY-NAME> reset

[no] [<SEQUENCE-NUMBER>]
       class {gbp-ip | gbp-ipv6 | gbp-mac} <CLASS-NAME> [action {drop | reflect}]
[no] [<SEQUENCE-NUMBER>] comment <TEXT-STRING>
```

Description

Creates, deletes, or modifies a group based policy and its entries. Group based policy consists of one or more policy entries that are ordered and prioritized by sequence numbers. Each entry has a GBP-IPv4, GBP-IPv6, or a GBP-MAC class, and corresponding drop or permit policy actions associated with it. A group-based policy has an implicit permit rule to allow any traffic originating from the source role **infra**.

The **no** form of the command deletes either a group based policy or an individual policy entry.

When configuring GBP-MAC class along with other classes, you must configure the GBP-MAC class entry at the end. For example, if you configure as shown below:

```
port-access gbp gbp1
          class gbp-mac class1
          class gbp-ip class2 action drop
```

Although, you would want to drop GBP-IPv4 traffic, it will be allowed because traffic will be allowed because of the MAC rule. In order to drop traffic, you must configure as show below:

```
port-access gbp gbp1
          class gbp-ip class2 action drop
          class gbp-mac class1
```

Usage

To use a GBP, you must associate the policy with a role using the **associate gbp** command.

- A group based policy that is in use cannot be removed from the configuration. To remove, the policy must be unassociated with the roles currently using the policy.
- Entering an existing *`<POLICY-NAME>`* value modifies the existing policy, with any new sequence number creating an additional policy entry, and any existing sequence number replacing the existing policy entry with the same sequence number.
- If no sequence number is specified, a new policy entry will be appended with a sequence number equal to the highest policy entry currently in the list plus 10.
- You can reorder the sequence numbers with the **class resequence** command.

Parameter	Description
<POLICY-NAME>	Specifies the class name.
<SEQUENCE-NUMBER>	Specifies the policy entry sequence number. Range: **1** to **4294967295**.
`class-type`	Specifies the type of class to associate with the policy.
<CLASS-NAME>	Specifies the class name.

`action`	Specifies the action for the class. The default action is to permit all traffic, if the action is not specified as drop explicitly.
	Other available actions are:
	`drop`
	Selects drop of all traffic.
	`reflect`
	Enables the switch to allow a packet destined to the client only if the flow is learned (the flow is initiated by the client).

Examples

Creating a policy and associating it with GBP IPv4 class to permit all traffic:

```
switch(config)# port-access gbp policy01
switch(config-pa-role)# 10 class my_gbp_ip_class
```

Creating a policy and associating it with GBP MAC class to deny all traffic:

```
switch(config)# port-access gbp policy01
switch(config-pa-role)# 10 class my_gbp_mac_class action drop
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	Added support for reflexive policies.
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-class-`*<CLASS-TYPE>*	Administrators or local user group members with execution rights for this command.

port-access reflexive

```
port-access reflexive
   {gbp|policy} enable
   no...
```

Description

This command enables the use of reflexive port access and group-based policies.

Regular stateless policies allow or deny traffic in the ingress or the egress direction. As a result, reverse traffic that belongs to the same flow will require a separate policy in the opposite direction. This can require complex policies that can be difficult to manage. When reflexive port access policies are enabled, the switch maintains an internal flow table for permitted traffic, and automatically allows return traffic for permitted flows.

When reflexive port access or group-based policies are enabled using this command, all existing port-access clients associated with a reflexive port-access policy, application based policy or group-based policy are logged off from the system.

The **no** form of the command disables reflexive policies and returns port access and group-based policies to the regular stateless status.

This feature can only be used with TCP/UDP Unicast traffic protocols. Protocols like TFTP, DHCP, and ICMP that use a different IP address or port in the request and the corresponding response must not be configured as a reflect entry.

Parameter	Description
gbp	Enables reflexive group-based policies.
policy	Enables reflexive port access policies.

Prerequisites

Before you can enable reflexive policies, you must first configure a role ID using the following command:

```
switch(config)# gbp role <ROLE_NAME> <ROLE_ID>
```

Next,, enable flow tracking using the following commands:

```
switch(config)# no ip source-lockdown resource-extended
   Do you want to continue (y/n)? y
switch(config)# flow-tracking
switch(config-flow-tracking)# enable
```

Examples

Enable reflexive port-access policies:

```
switch(config)# port-access reflexive policy enable
```

Enable reflexive group-based policies:

```
switch(config)# port-access reflexive gbp enable
```

Creating a policy with two entries with reflexive action:

```
switch(config)# port-access policy CPPM
switch(config-pa-policy)# 10 class ip dns action reflect
switch(config-pa-policy)# 20 class ip ssh action reflect
switch(config-pa-policy)# 30 class ip clearpass-web action cir kbps 1024 cbs 2048
exceed drop
switch(config-pa-policy)# 40 class ip web-traffic action redirect captive-portal
switch(config-pa-policy)# exit
switch(config)# show port-access policy

Access Policy Details:
======================

Policy Name   : CPPM
Policy Type   : Local
Policy Status : Applied

SEQUENCE     CLASS           TYPE ACTION
-------- ------------ ---- ---------------------------
10        dns                ipv4 reflect
20        ssh                ipv4 reflect
30        clearpass-web      ipv4 cir kbps 1024 cbs 2048 exceed drop
40        web-traffic        ipv4 redirect captive-portal
```

The **Reflect** action enables the switch to allow a packet destined to the client only if the flow is learned, that is, the flow is initiated by the client.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400v2
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

port-access role associate gbp

```
port-access role <ROLE-NAME>
       associate gbp <POLICY-NAME>
no port-access role <ROLE-NAME>
    no associate gbp <POLICY-NAME>
```

Description

Associates a group based policy with a role.

The **no** form of this command dissociates the policy from the role.

Parameter	Description
<ROLE-NAME>	Specifies the role name.
<POLICY-NAME>	Specifies the group based policy name to associate with the role.

Examples

Associating a policy with a role:

```
switch(config)# port-access role EMPLOYEE
switch(config-pa-role)# associate gbp GROUPPOLICY
```

Dissociating a policy from the role:

```
switch(config)# port-access role EMPLOYEE
switch(config-pa-role)# no associate GBP
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

show class

```
show class {gbp-ip | gbp-ipv6 | gbp-mac} <CLASS-NAME> [commands] [configuration]
```

Description

Shows details of class configuration and its entries. Displays the active configuration providing the list of classes that have been configured and accepted by the system.

Usage

The **show class** command along with the **configuration** option displays the classes that are configured. The output of this command may not be the same as what is active due to unsupported command parameters or if the class was modified after the GBP policy was applied and might have been unsuccessful due to a lack of hardware resources. To determine if there is a discrepancy between what was configured and what is active, compare the output of the **show class** and the **show class**

configuration commands. If the active class configuration and the configured class is not the same, a warning message is displayed to help troubleshoot the difference.

Parameter	Description
<CLASS-NAME>	Specifies the class name.

Examples

Showing configured GBP classes:

```
switch# show classshow class gbp-ip my_gbp_ip_class
Type       Name
  Sequence Comment
           Action                         L3 Protocol
           Source Role Name               Source L4 Port(s)
           Destination Role Name          Destination L4 Port(s)
           Additional Parameters
--------------------------------------------------------------------------------
GBP-IPv4   my_gbp_ip_class
        1  match                           icmp
           any
           admin
        2  ignore                          udp
           default
           admin
        3  match                           tcp
           guest
           admin
        4  match                           tcp
           guest
           admin
           App-Category: social-networking
           App-Name: facebook
           Hit-counts: enabled
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

show gbp role-mapping

```
show gbp role-mapping
```

Description

Shows the list of default and configured mappings between role name and role ID.

Examples

Showing details of role name to role iD mapping:

```
switch (config)# show gbp role-mapping
GBP status : Enabled
GBP_ROLE                      GBP_ROLE_ID
-------------                 ---------------
employee                      130
admin                         200
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Informations

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access gbp

```
show port-access gbp [<POLICY-NAME>]
```

Description

Shows details of the group based policies and its current usage.

Parameter	Description
<POLICY-NAME>	Specifies the GBP policy name.

Examples

Showing details of group based policy:

```
switch (config)# show port-access gbp

Port Access GBP Details:
======================
GBP Name   : plcy
GBP Type   : Local
GBP Status : Rejected

SEQUENCE    CLASS                        TYPE     ACTION
----------- ---------------------------- -------- --------------------------------
--
10          cs                           gbp-ipv4 drop
20          cls6                         gbp-ipv6 permit
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

show port-access gbp hitcounts

`show port-access gbp [<POLICY-NAME>] hitcounts {client}`

Description

Shows statistics of the group based policy applied on the client. The output of this command helps to identify the group based policy entries that are currently matched.

Parameter	Description
<POLICY-NAME>	Specifies the GBP policy name.

Examples

Showing GBP statistics:

```
switch (config)# show port-access gbp gbp2000 hitcounts

Port Access GBP Hit-Counts Details:
======================================

GBP Name : gbp2000
GBP Type : Local
GBP Status : Applied

SEQUENCE    CLASS                            TYPE     ACTION
```

```
----------- -------------------------------- -------- -----------------------
10          class2000                        gbp-ipv4 permit
15          classinfra                       gbp-ipv4 permit
30          classmacinfra                    gbp-mac  permit

Class Name : class2000
Class Type : gbp-ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match tcp Role6 Role1 count                             10
20          match udp default Role1 count                           0

Class Name : classinfra
Class Type : gbp-ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match udp infra Role1 count                             4
20          match icmp infra Role1 count                            5

Class Name : classmacinfra
Class Type : gbp-mac

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match arp infra Role1 count                             0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 45

High Availability Commands

redundancy switchover

```
redundancy switchover
```

Description

Causes the switch to immediately switch over to the Standby Management Module. This command must be executed from the Active Management Module and will fail if the Standby Management Module is in a failed state or not present.

Examples

This example shows the redundancy switchover command on an active management module with a standby management module that is present.

```
switch#redundancy switchover
This command causes the switch to immediately switchover to the Standby Management
Module.
Do you want to continue [y/n]?
```

This example shows the redundancy switchover command on an active management module with a standby management module that is absent.

```
switch#redundancy switchover
Standby Management Module not found, switchover request ignored.
```

This example shows the redundancy switchover command on a standby management module.

```
switch#redundancy switchover
Redundancy switchover must be performed from the Active Management Module,
switchover request ignored.
```

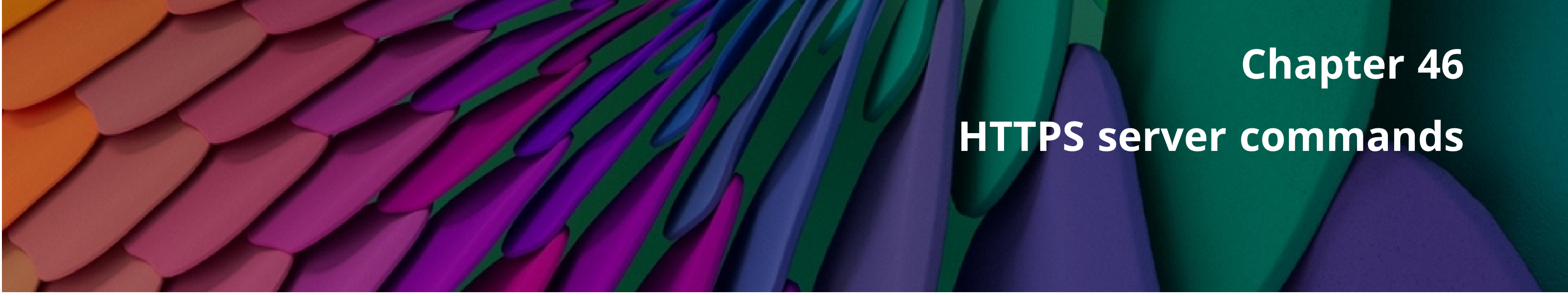
For more information on features that use this command, refer to the High Availability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 46

HTTPS server commands

https-server authentication certificate

`https-server authentication certificate [authorization radius] [username {<CERT-FIELD>}]`

Description

Enables authentication using an x509 certificate for authentication. When this option is configured, the https-server uses the user specified certificate for authentication, and the specified authorization mechanism is used to obtain the corresponding user role. The username embedded in the certificate is used for authorization with a remote user database.

Enabling password authentication is the only way of disabling certificate authentication.

> Only one authentication method can be enabled at a time. If you want to disable certificate-based authentication, then the password-based authentication must be enabled.

Parameter	Description
<AUTHORIZATION-RADIUS>	Specifies that after certificate authentication succeeds, instead of prompting for a password, the HTTPS server checks the RADIUS server only for authorization. When this parameter is omitted, **authorization radius** is still the assumed active setting.
<CERT-FIELD>	Selects which certificate username field is to be used for authorization. ■ Specify **user_pincipal_name** to use the certificate UserPrincipalName (UPN) field. This is the default. ■ Specify **common_name** to use the certificate CommonName (CN) field. When this parameter is omitted, **user_pincipal_name** is assumed.

Example

Enabling authentication using the certificate:

```
switch(config)# https-server authentication certificate authorization radius
username common_name
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

https-server authentication password

`https-server authentication password`

Description

Enables authentication using username and password, which corresponds to the default authentication mechanism. Enabling the password authentication mode disables the certificate authentication mode.

Only one authentication method can be enabled at a time.

Example

Enabling authentication using the password:

```
switch(config)# https-server authentication password
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

https-server max-user-sessions

`https-server max-user-sessions <SESSION-AMT>`

Description

Sets the maximum amount of concurrent open sessions for any given user through the HTTPS server. The amount of concurrent open sessions may have an impact on system performance, so it is recommended to set this value to the minimum necessary.

Parameter	Description
<SESSION-AMT>	Specifies the maximum number of user sessions allowed. Default: 6. Maximum value: 8.

Example

Set the maximum number of concurrent user sessions to the maximum of 8:

```
switch(config)# https-server max-user-sessions 8
```

For more information on features that use this command, refer to the Network Analytics Engine Guide or the REST API Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

https-server rest access-mode

```
https-server rest access-mode {read-only | read-write}
```

Description

Changes the REST API access mode. The default mode is read-write. This command does not affect Central connections, which have permission to alter configurations regardless of the access mode set on the switch.

Parameter	Description
`read-write`	Selects the read/write mode. Allows POST, PUT, PATCH, and DELETE methods to be called on all configurable elements in the switch database.
`read-only`	Selects the read-only mode. Write access to most switch resources through the REST API is disabled.

Usage

Setting the mode to `read-write` on the REST API allows POST, PUT, PATCH, and DELETE methods to be called on all configurable elements in the switch database.

By default, REST APIs in the device are in the read-write mode. Some switch resources allow POST, PUT, PATCH, and DELETE regardless of REST API mode. REST APIs that are required to support the Web UI or the Network Analytics Engine expose POST, PUT, PATCH, or DELETE operations, even if the REST API access mode is set to read-only.

The REST API in read/write mode is intended for use by advanced programmers who have a good understanding of the system schema and data relationships in the switch database.

Because the REST API in read/write mode can access every configurable element in the database, it is powerful but must be used with extreme caution: No semantic validation is performed on the data you write to the database, and configuration errors can destabilize the switch.

On 6300 switches or 6400 switches, by default, the HTTPS server is enabled in `read-write` mode on the `mgmt` VRF. If you enable the HTTPS server on a different VRF, the HTTPS server is enabled in `read-only` mode.

Example

```
switch(config)# https-server rest access-mode read-only
```

For more information on features that use this command, refer to the Network Analytics Engine Guide or the REST API Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

https-server rest firmware-site-distribution

```
https-server rest firmware-site-distribution
no https-server rest firmware-site-distribution
```

Description

Enables the firmware site distribution server.

The firmware site distribution allows you to use a switch to distribute a firmware image file to other switches in the same network. This prevents the switches from connecting to the cloud or an external network to download a firmware image file.

On enabling the firmware site distribution, it exposes a REST endpoint that allows the switches to download a switch primary or secondary firmware image.

As per the limitation, up to two switches can download the firmware image simultaneously.

This endpoint is to be used along with REST `/firmware` endpoint to handle the firmware download and installation process.

The **no** form of this command disables the firmware site distribution server.

Example

Enabling the firmware site distribution server:

```
switch(config)# https-server rest firmware-site-distribution
```

Disabling the firmware site distribution server:

```
switch(config)# no https-server rest firmware-site-distribution
```

For more information on features that use this command, refer to the Network Analytics Engine Guide or the REST API Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

https-server session close all

```
https-server session close all
```

Description

Invalidates and closes all HTTPS sessions. All existing WebUI sessions (including sessions used for Central connections) will be logged out. REST and WebUI users will have to reauthenticate. and all real-time notification feature WebSocket connections are closed and must be resubscribed.

Usage

Typically, a user that has consumed the allowed concurrent HTTPS sessions and is unable to access the session cookie to log out manually must wait for the session idle timeout to start another session. This command is intended as a workaround to waiting for the idle timeout to close an HTTPS session. This command stops and starts the `hpe-restd` service, so using this command affects all existing REST sessions, Web UI sessions, and real-time notification subscriptions.

Example

```
switch# https-server session close all
```

For more information on features that use this command, refer to the Network Analytics Engine Guide or the REST API Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

https-server session-timeout

`https-server session-timeout <MINUTES>`

Description

Configures the timeout, in minutes, for any given HTTPS server session. A value of 0 disables the timeout. This command does not affect sessions used for Central connections.

Parameter	Description
<MINUTES>	Specifies the maximum idle time, in minutes for an HTTPS session. Default: 20. Maximum: 480 (8 hours). 0 disables the timeout, but the maxium is still enforced.

Example

```
switch(config)# https-server session-timeout 10
```

For more information on features that use this command, refer to the Network Analytics Engine Guide or the REST API Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

https-server vrf

```
https-server vrf <VRF-NAME>
no https-server vrf <VRF-NAME>
```

Description

Configures and starts the HTTPS server on the specified VRF, allowing access to REST and the WebUI from ports assigned to that VRF. This command does not affect access to Central instances, as this feature has its own dedicated connection channel.

The **no** form of the command stops any HTTPS servers running on the specified VRF and removes the HTTPS server configuration.

Parameter	Description
<VRF-NAME>	Specifies the VRF name. Required. Length: Up to 32 alpha numeric characters.

Usage

By using this command, you enable access to both the Web UI and to the REST API on the specified VRF. You can enable access on multiple VRFs.

By default, the 6200, 6300, and 6400 Switch Series have an HTTPS server enabled on the `mgmt` VRF and on the `default` VRF.

When the HTTPS server is not configured and running, attempts to access the Web UI or REST API result in `404 Not Found` errors.

The VRF you select determines from which network the Web UI and REST API can be accessed.

For example:

- If you want to enable access to the REST API and Web UI through the OOBM port (management IP address), specify the built-in management VRF (`mgmt`).
- If you want to enable access to the REST API and Web UI through the data ports (for "inband management"), specify the built-in default VRF (`default`).
- If you want to enable access to the REST API and Web UI through only a subset of data ports on the switch, specify other VRFs you have created.

Aruba Network Analytics Engine scripts run in the default VRF, but you do not have to enable HTTPS server access on the default VRF for the scripts to run. If the switch has custom Aruba Network Analytics Engine scripts that require access to the Internet, then for those scripts to perform their functions, you must configure a DNS name server on the default VRF.

Examples

Enabling access on all ports on the switch, specify the default VRF:

```
switch(config)# https-server vrf default
```

Enabling access on the OOBM port (management interface IP address), specify the management VRF:

```
switch(config)# https-server vrf mgmt
```

Enabling access on ports that are members of the VRF named `vrfprogs`, specify `vrfprogs`:

```
switch(config)# https-server vrf vrfprogs
```

Enabling access on the management port and ports that are members of the VRF named `vrfprogs`, enter two commands:

```
switch(config)# https-server vrf mgmt
switch(config)# https-server vrf vrfprogs
```

For more information on features that use this command, refer to the Network Analytics Engine Guide or the REST API Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show https-server

```
show https-server [vsx-peer]
```

Description

Shows the status and configuration of the HTTPS server. The REST API and web user interface are accessible only on VRFs that have the HTTPS server features configured.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Shows the configuration of the HTTPS server features.

`VRF`
Shows the VRFs, if any, for which HTTPS server features are configured.

`REST Access Mode`
Shows the configuration of the REST access mode:

`read-write`
POST, PUT, and DELETE methods can be called on all configurable elements in the switch database. This is the default value.

`read-only`
Write access to most switch resources through the REST API is disabled.

Examples

```
switch# show https-server

HTTPS Server Configuration
----------------------------

 VRF                  : default, mgmt
 REST Access Mode     : read-write

 Max sessions per user   : 6

 Session timeout         : 20
```

For more information on features that use this command, refer to the Network Analytics Engine Guide or the REST API Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show https-server authentication

`show https-server authentication`

Description

Shows the https-server authentication mode status.

Examples

Showing the authentication method with the password mode enabled:

```
switch# show https-server authentication

Authentication Modes Status
----------------------------
 Password Status           : enabled

 Certificate Status        : disabled
```

Showing the authentication method with the certificate mode enabled:

```
switch# show https-server authentication

Authentication Modes Status
----------------------------
 Password Status           : disabled


 Certificate Status        : enabled
```

Command History

Release	Modification
10.11	Command Introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 47
ICMP commands

ip icmp redirect

```
ip icmp redirect
no ip icmp redirect
```

Description

Enables the sending of ICMPv4 and ICMPv6 redirect messages to the source host. Enabled by default.

The **no** form of this command disables ICMPv4 and ICMPv6 redirect messages to the source host.

Examples

Enabling ICMP redirect messages:

```
switch(config)# ip icmp redirect
```

Disabling ICMP redirect messages:

```
switch(config)# no ip icmp redirect
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ip icmp throttle

```
ip icmp throttle <PACKET-INTERVAL>
no ip icmp throttle [<PACKET-INTERVAL>]
```

Description

Used to configure the throttle parameter for both ICMPv4 and ICMPv6 error messages and redirect messages.

The **no** form of this command disables the throttle parameter for both ICMPv4 and ICMPv6 error messages and redirect messages.

Parameter	Description
<PACKET-INTERVAL>	Specifies the ICMPv4/v6 packet interval in seconds. Default: 1 second. Range: 1-86400.

Examples

Enabling the throttle parameter for both ICMPv4 and ICMPv6 error messages and redirect messages:

```
switch(config)# ip icmp throttle 3000
```

Disabling the throttle parameter for both ICMPv4 and ICMPv6 error messages and redirect messages:

```
switch(config)# no ip icmp throttle
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.8	Added the optional *<PACKET-INTERVAL>* parameter to the **no** form of the command.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ip icmp unreachable

```
ip icmp unreachable
no ip icmp unreachable
```

Description

Enables the sending of ICMPv4 and ICMPv6 destination unreachable messages on the switch to a source host when a specific host is unreachable. The unreachable host address originates from the failed packed. Default setting.

The **no** form of this command disables the sending of ICMPv4 and ICMPv6 destination unreachable messages from the switch to a source host when a specific host is unreachable. This command does not prevent other hosts from sending an ICMP unreachable message.

Examples

Enabling ICMPv4 and ICMPv6 destination unreachable messages to a source host:

```
switch(config)# ip icmp unreachable
```

Disabling ICMPv4 and ICMPv6 destination unreachable messages to a source host:

```
switch(config)# no ip icmp unreachable
```

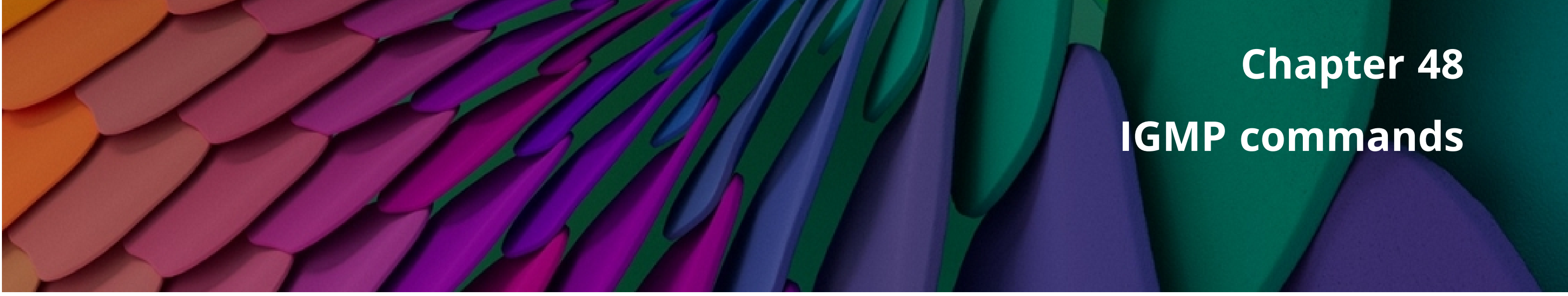
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.



Chapter 48

IGMP commands

For commands in the interface configuration context, the interface must be an L3 interface. The supported contexts include: `config-if`, `config-if-vlan`, `config-lag-if`, `config-sub-if`.

The sub-interface related configuration examples provided in this section apply only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

ip igmp

```
ip igmp {enable | disable}
no ip igmp [enable | disable]
```

Description

Enables or disables IGMP on the current interface. IGMP is disabled by default.

The **no** form of this command disables IGMP on the current interface.

Parameter	Description
`enable`	Enable IGMP.
`disable`	Disable IGMP.

Examples

Enabling IGMP on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp enable
Disabling IGMP on interface VLAN 2:
```

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp disable
```

Enabling IGMP on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no shutdown
switch(config-if)# routing

switch(config-subif)# ip igmp enable
```

Disabling IGMP on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-subif)# ip igmp disable
```

```
switch(config)# interface 1/1/1
switch(config-subif)# no ip igmp enable
```

Enabling IGMP on sub-interface 1/1/1.1:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.1
switch(config-subif)# no shutdown
switch(config-subif)# ip igmp enable
```

Disabling IGMP on sub-interface 1/1/1.1:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.1
switch(config-subif)# ip igmp disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip igmp apply access-list

```
ip igmp apply access-list <ACL-NAME>
no ip igmp apply access-list <ACL-NAME>
```

Description

Configures the ACL on a particular interface to filter the IGMP join or leave packets based on rules set in the particular ACL name.

The **no** form of this command unconfigures the rules set for the ACL.

This configuration will override the ACL associated with IGMP snooping on the corresponding L2 VLAN.

Parameter	Description
`access-list`	Associates an ACL with the IGMP.
`<ACL-NAME>`	Specifies the name of the ACL.

Usage

- Existing classifier commands are used to configure the ACL.
- In case an IGMPv3 packet with multiple group addresses is received, the switch only processes the permitted group addresses based on the ACL rule set. The packet is forwarded to querier and PIM router even though one of the groups present in the packet is blocked by ACL. This avoids the delay in learning of the permitted groups. Since the access switch configured with ACL blocks the traffic for the groups which are denied, forwarding of joins has no impact. If all the groups in the packet are denied by the ACL rule, the packet is not forwarded to the querier and PIM router. Existing joins will timeout.
- In case of IGMPv2, if there is no match or if there is a deny rule match, the packet is dropped.

Examples

Configuring the ACL on a VLAN to filter IGMP packets based on permit/deny rules set in access list **mygroup**:

```
switch(config)# access-list ip mygroup
switch(config-acl-ip)# 10 deny igmp any 239.255.255.250
switch(config-acl-ip)# 20 deny igmp any 239.255.255.253
switch(config-acl-ip)# 30 permit igmp any 239.1.1.1
switch(config-acl-ip)# exit
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp apply access-list mygroup
```

Configuring the ACL to remove the rules set in access list **mygroup**:

```
switch(config-if-vlan)# no ip igmp apply access-list mygroup
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip igmp last-member-query-interval

```
ip igmp last-member-query-interval <INTERVAL-VALUE>
no ip igmp last-member-query-interval <INTERVAL-VALUE>
```

Description

Configures an IGMP last member query interval value in seconds on an interface, depending on the command context you are in.

The **no** form of this command sets the value to a default of 1 second on an interface.

Parameter	Description
<INTERVAL-VALUE>	Specifies an IGMP last-member-query-interval on the interface. Default: 1 second. Range: 1-2 seconds.

Examples

Configuring an IGMP last member query interval of 2 on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp last-member-query-interval 2
switch(config-if-vlan)# no ip igmp last-member-query-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ip igmp querier

```
ip igmp querier
no ip igmp querier
```

Description

Configures an IGMP querier on an interface, depending on the command context you are in. This functionality will allow an interface to join in the querier-election process.

The **no** form of this command disables IGMP querier on an interface.

Examples

Configuring an IGMP querier on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp querier
```

Disabling an IGMP querier on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# no ip igmp querier
```

Configuring an IGMP querier on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no shutdown
switch(config-if)# routing
switch(config-subif)# ip igmp querier
```

Disabling an IGMP querier on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-subif)# no ip igmp querier
```

Configuring an IGMP querier on sub-interface 1/1/1.1

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.1
switch(config-subif)# no shutdown
switch(config-subif)# ip igmp querier
```

Disabling an IGMP querier on sub-interface 1/1/1.1:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.1
switch(config-subif)# no ip igmp querier
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip igmp querier interval

```
ip igmp querier interval <INTERVAL-VALUE>
no ip igmp querier interval
```

Description

Configures the interval between IGMP queries on an interface, depending on the command context you are in.

The **no** form of this command sets the IGMP querier interval to the default value of 125 seconds on an interface.

Parameter	Description
<INTERVAL-VALUE>	Specifies the IGMP querier interval in seconds on the interface. Default: 125 seconds. Range: 5-300.

Examples

Configuring an IGMP querier interface interval of 100 on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp querier interval 100
```

Resetting an IGMP querier interval to the default value:

```
switch(config-if-vlan)# no ip igmp querier interval
```

Configuring an IGMP querier interface interval of 100 on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no shutdown
switch(config-if)# routing
switch(config-subif)# ip igmp querier interval 100
```

Configuring an IGMP querier interface interval of 100 on sub-interface 1/1/1.1:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.1
switch(config-subif)# no shutdown
switch(config-subif)# ip igmp querier interval 100
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip igmp querier-wait-time

```
ip igmp querier-wait-time <QUERIER-WAIT-TIME>
no ip igmp querier-wait-time <QUERIER-WAIT-TIME>
```

Description

Configures initial IGMP querier-wait-time value in seconds.

The **no** form of this command sets the IGMP querier-wait-time to the default value of 260 seconds. Note that the wait timer can be configured to any numbers within the 1-300 second range.

Parameter	Description
<QUERIER-WAIT-TIME>	Configures IGMP querier-wait-time to desired value.

Examples

Configuring IGMP querier-wait-time:

```
6200-1(config-if-vlan)# ip igmp querier-wait-time
<1-300>  Querier Wait value (Default: 260)
6200-1(config-if-vlan)#
```

When PIM is enabled, automated election will override querier-wait-time configuration. When PIM is disabled and **[no] igmp querier-wait-time** is configured, the initial wait timer will be configured at desired value.

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ip igmp querier query-max-response-time

```
ip igmp querier query-max-response-time <RESPONSE-TIME>
no ip igmp querier query-max-response-time <RESPONSE-TIME>
```

Description

Configures the IGMP querier max response time value in seconds on an interface, depending on the command context you are in.

The **no** form of this command sets the querier max response time value to the default of 10 seconds on an interface.

Parameter	Description
<RESPONSE-TIME>	Specifies the IGMP querier max response time value on the interface. Default: 10 seconds. Range: 10-128 seconds.

Examples

Configuring the IGMP querier maximum response time of 50 for interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp query-max-response-time 50
```

Resetting an IGMP querier interval to the default value:

```
switch(config-if-vlan)# no ip igmp query-max-response-time
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ip igmp robustness

```
ip igmp robustness <VALUE>
no ip igmp robustness <VALUE>
```

Description

Configures IGMP robustness on an interface, depending on the command context. The robustness parameter allows tuning for the expected packet loss on a subnet.

The **no** form of this command sets the robustness value to the default of 2 on an interface.

Parameter	Description
<VALUE>	Specifies an IGMP robustness value on the interface. Default: 2. Range: 1-7.

Examples

Configuring an IGMP robustness of 5 on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp robustness 5
```

Resetting the IGMP robustness to the default:

```
switch(config-if-vlan)# no ip igmp robustness
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ip igmp router-alert-check

```
ip igmp router-alert-check [enable | disable]
no ip igmp router-alert-check [enable | disable]
```

Description

Enables or disables IGMP router alert check for IGMP packets. IGMP packets without the router alert field set are dropped if router alert check is enabled. Router alert check is disabled by default.

The **no** form of this command disables router alert check for IGMP packets.

Parameter	Description
`enable`	Enable IGMP router alert check.
`disable`	Disable IGMP router alert check.

Examples

Enabling IGMP router alert check on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp router-alert-check enable
```

Disabling IGMP router alert check on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp router-alert-check disable
```

```
switch(config)# interface vlan 2
switch(config-if-vlan)# no ip igmp router-alert-check enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	config-if-vlan config-if config-lag-if	Administrators or local user group members with execution rights for this command.

ip igmp static-group

```
ip igmp static-group <MULTICAST-GROUP-IP>
no ip igmp static-group <MULTICAST-GROUP-IP>
```

Description

Configures an IGMP static multicast group on an interface, depending on the command context you are in. You can configure a maximum of 32 IGMP static groups.

The **no** form of the command unconfigures IGMP static multicast group on an interface.

Parameter	Description
<MULTICAST-GROUP-IP>	Specifies an IGMP static multicast group IP address on the interface. Format: A.B.C.D

Examples

Administrators or local user group members with execution rights for this command.

Configuring an IGMP static group on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp static-group 239.1.1.1
```

Resetting an IGMP static group on an interface to the default (none):

```
switch(config-if)# no ip igmp static-group 239.1.1.10
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	config-if-vlan config-if config-lag-if	Administrators or local user group members with execution rights for this command.

ip igmp version

```
ip igmp version <VERSION>
no ip igmp version <VERSION>
```

Description

Configures the IGMP version on an interface, depending on the command context you are in.

The **no** form of the command configures the default IGMP version, 3, on the interface.

Parameter	Description
<VERSION>	Specifies the IGMP version on the interface. Select 2 for IGMPv2 (RFC2236). Select 3 for IGMPv3 (RFC3376). Values: 2 or 3.

Examples

Configuring an IGMP version on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp version 2
```

Configuring an IGMP version on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# ip igmp version 2
```

Removing an IGMP version on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# no ip igmp version 2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if-vlan config-if config-lag-if	Administrators or local user group members with execution rights for this command.

ip igmp version strict

```
ip igmp version <VERSION> strict
no ip igmp version <VERSION> strict
```

Description

Configures an IGMP strict version on an interface, depending on the command context you are in. Drops packets that do not match the configured version.

The **no** form of the command removes the strict version configuration from the interface.

Parameter	Description
`<VERSION>`	Specifies the IGMP version on the interface. Select 2 for IGMPv2 (RFC2236). Select 3 for IGMPv3 (RFC3376). Values: 2 or 3.

Examples

Configuring the IGMP strict version to 2 on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp version 2 strict
```

Resetting the IGMP strict version to the default (none):

```
switch(config-if)# no ip igmp version 2 strict
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

no ip igmp

```
no ip igmp
```

Description

Disables all IGMP configurations on an interface or sub-interface, depending on the command context you are in.

Examples

Removing IGMP on interface VLAN 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# no ip igmp
```

Removing IGMP on interface 1/1/1:

```
switch(config)# interface 1/1/1

switch(config-subif)# no ip igmp
```

Removing IGMP on sub-interface 1/1/1.1:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.1
switch(config-subif)# no ip igmp
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if-vlan`
	`config-if`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

show ip igmp

`show ip igmp [vrf <VRF-NAME> | all-vrfs] [vsx-peer]`

Description

Shows IGMP configuration information and status, or shows information by VRF.

Parameter	Description
`vrf <VRF-NAME> | all-vrfs`	Optional. Used to show information

Parameter	Description
	by VRF. Specify the VRF by VRF name. With no **`<VRF-NAME>`** specified, the default VRF is implied. To show information for all VRFs, specify **all-vrfs**.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP configuration and status:

```
switch# show ip igmp

VRF Name  : default
Interface : vlan2
IGMP Configured Version    : 3
IGMP Operating Version     : 3
Querier State              : Querier
Querier IP [this switch]   : 20.1.1.1
Querier Uptime             : 1m 4s
Querier Expiration Time    : 0m 1s
IGMP Snoop Enabled on VLAN : True
```

Showing IGMP information for VRF test:

```
switch# show ip igmp vrf test

VRF Name  : test
Interface  : 1/1/2
IGMP Configured Version  : 3
IGMP Operating Version   : 2
Querier State            : Querier
Querier IP [this switch] : 100.1.1.1
Querier Uptime           : 2m 55s
Querier Expiration Time  : 0m 16s

Active Group Address   Vers Mode Uptime    Expires
---------------------- ---- ---- --------- ---------
240.100.3.194          3    INC  0m 30s    3m 50s


IGMP is not enabled on interface 1/1/3


VRF Name  : test
Interface  : vlan2
IGMP Configured Version    : 3
IGMP Operating Version     : 3
Querier State              : Querier
Querier IP [this switch]   : 20.1.1.1
Querier Uptime             : 1m 4s
Querier Expiration Time    : 0m 1s
IGMP Snoop Enabled on VLAN : True

Active Group Address   Vers Mode Uptime    Expires
---------------------- ---- ---- --------- ---------
238.224.153.165        2         0m 38s    3m 42s


VRF Name  : test
Interface  : vlan10
IGMP Configured Version    : 3
IGMP Operating Version     : 3
Querier State              : Querier
Querier IP [this switch]   : 10.1.1.1
Querier Uptime             : 1m 4s
Querier Expiration Time    : 0m 1s
IGMP Snoop Enabled on VLAN : True

Active Group Address   Vers Mode Uptime    Expires
---------------------- ---- ---- --------- ---------
239.209.3.194          3    INC  0m 38s    3m 42s
```

Showing IGMP information for all VRFs:

```
switch# show ip igmp all-vrfs
VRF Name  : test
Interface  : 1/1/2
IGMP Configured Version  : 3
IGMP Operating Version   : 2
Querier State            : Querier
Querier IP [this switch] : 100.1.1.1
Querier Uptime           : 2m 55s
Querier Expiration Time  : 0m 16s

Active Group Address   Vers Mode Uptime    Expires
---------------------- ---- ---- --------- ---------
240.100.3.194          3    INC  0m 30s    3m 50s

VRF Name  : test
Interface  : vlan2
IGMP Configured Version    : 3
IGMP Operating Version     : 3
Querier State              : Querier
Querier IP [this switch]   : 20.1.1.1
Querier Uptime             : 1m 4s
Querier Expiration Time    : 0m 1s
IGMP Snoop Enabled on VLAN : True

Active Group Address   Vers Mode Uptime    Expires
---------------------- ---- ---- --------- ---------
238.224.153.165        2         0m 38s    3m 42s
VRF Name  : default
Interface  : vlan5
IGMP Configured Version    : 3
IGMP Operating Version     : 2
Querier State              : Querier
Querier IP [this switch]   : 50.1.1.1
Querier Uptime             : 1m 1s
Querier Expiration Time    : 0m 4s
IGMP Snoop Enabled on VLAN : False
VRF Name  : test
```

```
Interface  : vlan10
IGMP Configured Version    : 3
IGMP Operating Version     : 3
Querier State              : Querier
Querier IP [this switch]   : 10.1.1.1
Querier Uptime             : 1m 4s
Querier Expiration Time    : 0m 1s
IGMP Snoop Enabled on VLAN : True

Active Group Address   Vers Mode Uptime    Expires
---------------------- ---- ---- --------- ---------
239.209.3.194          3    INC  0m 38s    3m 42s
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp counters

`show ip igmp counters [vrf <VRF-NAME> | all-vrfs] [vsx-peer]`

Description

Shows IGMP counter details, or shows counters by VRF.

Parameter	Description
`vrf <VRF-NAME> | all-vrfs`	Optional. Used to show information by VRF. Specify the VRF by VRF name. With no **<VRF-NAME>** specified, the default VRF is implied. Specify **all-vrfs** to show information for all VRFs.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP counters:

```
switch# show ip igmp counters

IGMP Counters

Interface Name      : vlan2
VRF Name            : default
Membership Timeout  : 0
                                             Rx            Tx
                                             ------------- -------------
V1 All Hosts Queries                         0             0
V2 All Hosts Queries                         0             12
V3 All Hosts Queries                         0             0
V2 Group Specific Queries                    0             0
V3 Group Specific Queries                    0             0
Group And Source Specific Queries            0             0
V3 Member Reports                            0             N/A
V2 Member Reports                            0             N/A
V1 Member Reports                            0             N/A
V2 Member Leaves                             0             N/A
Packets dropped by ACL                       0             N/A
```

Showing IGMP counters for the default VRF:

```
switch# show ip igmp counters vrf default

IGMP Counters

Interface Name      : vlan2
VRF Name            : default
Membership Timeout  : 0
                                             Rx            Tx
                                             ------------- -------------
V1 All Hosts Queries                         0             0
V2 All Hosts Queries                         0             12
V3 All Hosts Queries                         0             0
V2 Group Specific Queries                    0             0
V3 Group Specific Queries                    0             0
Group And Source Specific Queries            0             0
V3 Member Reports                            0             N/A
V2 Member Reports                            0             N/A
V1 Member Reports                            0             N/A
V2 Member Leaves                             0             N/A
Packets dropped by ACL                       0             N/A
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp group

`show ip igmp group <GROUP-IP> [source <SOURCE-IP>] [vrf <VRF-NAME> | all-vrfs] [vsx-peer]`

Description

Shows IGMP joined group information for the specified group, or shows joined group source and display information by VRF.

Parameter	Description
<GROUP-IP>	Specifies the IP address of the group. Format: A.B.C.D
`source <SOURCE-IP>`	Specifies the IP address of the source. Format: A.B.C.D
`vrf <VRF-NAME> | all-vrfs`	Optional. Used to show information by VRF. Specify the VRF by VRF name. With no **<VRF-NAME>** specified, the default VRF is implied. Specify **all-vrfs** to show information for all VRFs.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP joined group details for group 239.1.1.10:

```
switch# show ip igmp group 239.1.1.10

IGMP group information for group 239.1.1.10

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.10
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  16m 34s   2m 27s
```

Showing IGMP joined group details for group 239.1.1.10 and source 10.1.1.10:

```
switch# show ip igmp group 239.1.1.10 source 10.1.1.10

Interface Name  : vlan2
VRF Name  : default
Group Address  : 239.1.1.10
```

```
Source Address : 10.1.1.10

Mode Uptime    Expire
---- --------- -------
     0m 13s    4m 7s
```

Showing IGMP joined group details for group 239.1.1.10 for all VRFs:

```
switch# show ip igmp group 239.1.1.10 all-vrfs

IGMP group information for group 239.1.1.10

Interface Name   : vlan10
VRF Name         : default

Group Address    : 239.1.1.10
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  17m 5s    4m 2s
```

Showing IGMP joined group details for group 239.1.1.10 source 10.1.1.10 for all VRFs:

```
switch# show ip igmp group 239.1.1.10 source 10.1.1.10 all-vrfs

Interface Name  : vlan10
VRF Name  : default
Group Address  : 239.1.1.10
Source Address : 10.1.1.10

Mode Uptime    Expire
---- --------- -------
     0m 39s    3m 41s
```

Showing IGMP joined group details group 239.1.1.10 for the default VRF:

```
switch# show ip igmp group 239.1.1.10 vrf default

IGMP group information for group 239.1.1.10

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.10
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  17m 35s   3m 32s
```

Showing IGMP joined group details group 239.1.1.10 source 10.1.1.10 for the default VRF:

```
switch# show ip igmp group 239.1.1.10 source 10.1.1.10 vrf default

Interface Name  : vlan10
VRF Name  : default
Group Address  : 239.1.1.10
Source Address : 10.1.1.10

Mode Uptime    Expire
---- --------- -------
     0m 59s    3m 21s
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp groups

`show ip igmp groups [vrf <VRF-NAME> | all-vrfs] [vsx-peer]`

Description

Shows IGMP group information, or you can display group information by VRF.

Parameter	Description
`vrf <VRF-NAME> | all-vrfs`	Optional. Used to show information by VRF. Specify the VRF by VRF name. With no **<VRF-NAME>** specified, the default VRF is implied. Specify **all-vrfs** to show information for all VRFs.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP group information:

```
switch# show ip igmp groups
```

```
IGMP group information for group 239.1.1.10

Interface Name    : vlan2
VRF Name          : default

Group Address     : 239.1.1.10
Last Reporter     : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 36s    3m 44s

IGMP group information for group 239.1.1.11

Interface Name    : vlan2
VRF Name          : default

Group Address     : 239.1.1.11
Last Reporter     : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 36s    3m 44s
```

Showing IGMP groups for all VRFs:

```
switch# show ip igmp groups all-vrfs
IGMP group information for group 239.1.1.1

Interface Name    : vlan10
VRF Name          : test

Group Address     : 239.1.1.1
Last Reporter     : 100.1.1.20

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 13s    4m 7s

IGMP group information for group 239.1.1.2

Interface Name    : vlan10
VRF Name          : test

Group Address     : 239.1.1.2
Last Reporter     : 100.1.1.20

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 13s    4m 7s

IGMP group information for group 239.1.1.1

Interface Name    : vlan10
VRF Name          : test

Group Address     : 239.1.1.1
```

```
Last Reporter    : 100.1.1.20

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 13s    4m 7s

IGMP group information for group 239.1.1.2

Interface Name   : vlan10
VRF Name         : test

Group Address    : 239.1.1.2
Last Reporter    : 100.1.1.20

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 13s    4m 7s

IGMP group information for group 239.1.1.1

Interface Name   : vlan20
VRF Name         : default

Group Address    : 239.1.1.1
Last Reporter    : 200.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 13s    4m 7s

IGMP group information for group 239.1.1.2

Interface Name   : vlan20
VRF Name         : default

Group Address    : 239.1.1.2
Last Reporter    : 200.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  0m 13s    4m 7s
```

Showing IGMP groups for the default VRF:

```
switch# show ip igmp groups vrf default

IGMP group information for group 239.1.1.10

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.10
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
```

```
3    EXC  9m 23s    3m 20s

IGMP group information for group 239.1.1.11

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.11
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  9m 23s    3m 20s

IGMP group information for group 239.1.1.10

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.10
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  9m 23s    3m 20s

IGMP group information for group 239.1.1.11

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.11
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    EXC  9m 23s    3m 20s
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp interface

```
show ip igmp interface [{<INTF-ID>|<INTF-ID.ID>|{vlan <VLAN-ID>}]
counters [vsx-peer]
group <A.B.C.D> [{source <A.B.C.D>}| [vsx-peer]
groups [vsx-peer]
statistics [vsx-peer]
[vsx-peer]
```

Description

Shows IGMP configuration information for a specific interface (VLAN, port or LAG).

Parameter	Description
`<INTF-ID>`	Specifies an interface (such as 1/1/2 or LAG10).
`<INTF-ID.ID>`	Required. Specifies a sub-interface. (Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.)
`vlan <VLAN-ID>`	Specifies a VLAN. Values: 1-4094.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP configuration information for interface VLAN 2:

```
switch# show ip igmp interface vlan 2

IGMP Configured Version   : 3
IGMP Operating Version    : 3
Querier State             : Querier
Querier IP [this switch] : 20.1.1.1
Querier Uptime            : 1m 46s
Querier Expiration Time   : 0m 1s
Snoop Enabled on VLAN     : True

switch# show ip igmp interface vlan  10

IGMP is not enabled
```

Showing IGMP configuration information for the specified interface 1/1/2:

```
switch# show ip igmp interface 1/1/2

IGMP Configured Version     : 3
IGMP Operating Version      : 3
Querier State               : Querier
Querier IP [this switch]    : 100.1.1.1
Querier Uptime              : 51m 44s
Querier Expiration Time     : 1m 51s
```

Showing IGMP configuration information for sub-interface 1/1/5.10:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch# show ip igmp interface 1/1/5.10

IGMP Configured Version     : 3
IGMP Operating Version      : 3
Querier State               : Querier
Querier IP [this switch]    : 200.1.1.1
Querier Uptime              : 11m 44s
Querier Expiration Time     : 1m 51s
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp interface counters

`show ip igmp interface {<INTF-ID> | <INTF-ID.ID>| vlan <VLAN-ID>} counters [vsx-peer]`

Description

Shows IGMP counter details for a specific interface or VLAN interface.

Parameter	Description
<INTF-ID>	Specifies an interface (such as 1/1/2).
<INTF-ID.ID>	Required: Specifies a sub-interface. (Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.)
vlan *<VLAN-ID>*	Specifies a VLAN. Values: 1-4094.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP counters for interface VLAN 2:

```
switch# show ip igmp interface vlan 2 counters

IGMP Counters

Interface Name      : vlan2
VRF Name            : default
Membership Timeout  : 0
                                             Rx            Tx
                                             ------------- -------------
V1 All Hosts Queries                         0             0
V2 All Hosts Queries                         0             0
V3 All Hosts Queries                         0             29
V2 Group Specific Queries                    0             0
V3 Group Specific Queries                    0             2
Group And Source Specific Queries            0             2
V3 Member Reports                            0             N/A
V2 Member Reports                            0             N/A
V1 Member Reports                            0             N/A
V2 Member Leaves                             0             N/A
Packets dropped by ACL                       0             N/A
```

Showing IGMP counters for sub-interface 10:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch# show ip igmp interface 1/1/5.10 counters

IGMP Counters

Interface Name      : 1/1/5.10
VRF Name            : default
Membership Timeout  : 0
                                             Rx            Tx
                                             ------------- -------------
V1 All Hosts Queries                         0             0
V2 All Hosts Queries                         0             0
V3 All Hosts Queries                         0             9
V2 Group Specific Queries                    0             0
V3 Group Specific Queries                    0             0
Group And Source Specific Queries            0             0
V3 Member Reports                            3             N/A
V2 Member Reports                            4             N/A
V1 Member Reports                            0             N/A
V2 Member Leaves                             0             N/A
Packets dropped by ACL                       0             N/A
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp interface group

```
show ip igmp [interface {<INTF-ID> | <INTF-ID.ID> | vlan <VLAN-ID>} [group <GROUP-IP>
[source <SOURCE-IP>] [vsx-peer]]]
```

Description

Shows IGMP joined group information for a specific interface or VLAN interface, or specify a source IP.

Parameter	Description
<INTF-ID>	Specifies an interface (such as 1/1/2).
<INTF-ID.ID>	Required: Specifies the sub-interface. (Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.)
vlan *<VLAN-ID>*	Specifies a VLAN. Values: 1-4094.
<GROUP-IP>	Specifies the IP address of the group. Format: A.B.C.D
source *<SOURCE-IP>*	Specifies the IP address of the source. Format: A.B.C.D
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP joined group details for group 239.1.1.1 for interface VLAN 10:

```
switch# show ip igmp interface vlan 10 group 239.1.1.1

IGMP group information for group 239.1.1.1

Interface Name   : vlan10
VRF Name         : default

Group Address    : 239.1.1.1
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
```

```
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    INC  8m 10s    2m 21s                        1

Group Address  : 239.1.1.1
Source Address : 10.1.1.1

Mode Uptime    Expire
---- --------- -------
INC  8m 10s    2m 21s
```

Showing IGMP joined group details for group 239.1.1.1 for interface VLAN 10 with source details for 10.1.1.1:

```
switch# show ip igmp interface vlan 10 group 239.1.1.1 source 10.1.1.1

Interface Name  : vlan10
VRF Name  : default
Group Address  : 239.1.1.1
Source Address : 10.1.1.1

Mode Uptime    Expire
---- --------- -------
INC  8m 52s    3m 51s
```

Showing IGMP joined group details for group 239.1.1.1 for sub-interface 1/1/1.10:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch# show ip igmp interface 1/1/5.10 group 239.1.1.1

IGMP group information for group 239.1.1.1

Interface Name   : 1/1/5.10
VRF Name         : default

Group Address    : 239.1.1.1
Last Reporter    : 10.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    INC  1m 49s    1m 31s                        1

Group Address  : 239.1.1.1
Source Address : 10.1.1.1

Mode Uptime    Expire
---- --------- -------
INC  1m 49s    1m 31s
```

Showing IGMP joined group details for group 239.1.1.1 for sub-interface 1/1/1.10 with source details for 10.1.1.1:

```
switch# show ip igmp interface 1/1/5.10 group 239.1.1.1 source 10.1.1.1

Interface Name  : 1/1/5.10
VRF Name  : default
Group Address  : 239.1.1.1
Source Address : 10.1.1.1

Mode Uptime    Expire
---- --------- -------
INC  1m 3s     4m 25s
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp interface groups

```
show ip igmp [interface {<INTF-ID> |  <INTF-ID.ID> | vlan <VLAN-ID>} [groups] [vsx-peer]]
```

Description

Shows IGMP group information for a specific interface or VLAN interface.

Parameter	Description
<INTF-ID>	Specifies an interface (such as 1/1/2).
<INTF-ID.ID>	Required: Specifies the sub-interface. (Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.)
vlan *<VLAN-ID>*	Specifies a VLAN. Values: 1-4094.
<GROUP-IP>	Specifies the IP address of the group. Format: A.B.C.D
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP groups for interface VLAN 2:

```
switch# show ip igmp interface vlan 2 groups

IGMP group information for group 239.1.1.1

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.1
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    INC  4m 40s    3m 51s                        1

Group Address  : 239.1.1.1
Source Address : 10.1.1.1

Mode Uptime    Expire
----------------------
INC  4m 40s    3m 51s

IGMP group information for group 239.1.1.2

Interface Name   : vlan2
VRF Name         : default

Group Address    : 239.1.1.2
Last Reporter    : 100.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
3    INC  4m 40s    3m 51s                        1

Group Address  : 239.1.1.2
Source Address : 10.1.1.1

Mode Uptime    Expire
---- --------- -------
INC  4m 40s    3m 51s
```

Showing IGMP groups for sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch# show ip igmp interface 1/1/5.10 groups

IGMP group information for group 239.1.1.1

Interface Name   : 1/1/5.10
VRF Name         : default

Group Address    : 239.1.1.10
Last Reporter    : 10.1.1.1

                              V1        V2        Sources   Sources
```

```
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
2         11m 59s   1m 44s              1m 44s

IGMP group information for group 239.1.1.2

Interface Name   : 1/1/5.10
VRF Name         : default

Group Address    : 239.1.1.20
Last Reporter    : 10.1.1.10

                              V1        V2        Sources   Sources
Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------- --------
2         11m 59s   1m 44s              1m 44s
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp interface statistics

```
show ip igmp interface {<INTF-ID> | <INTF-ID.ID> | vlan <VLAN-ID>} statistics [vsx-peer]
```

Description

Shows IGMP statistics for a specific interface or VLAN interface, including groups joined.

Parameter	Description
<INTF-ID>	Specifies an interface (such as 1/1/2 or LAG1).
<INTF-ID.ID>	Required: Specifies the sub-interface. (Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.)
vlan *<VLAN-ID>*	Specifies a VLAN. Values: 1-4094.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP statistics for interface VLAN 2:

```
switch# show ip igmp interface vlan 2 statistics

IGMP statistics

Interface Name : vlan2
VRF Name       : default

Number of Include Groups       :   2
Number of Exclude Groups       :   0
Number of Static Groups        :   0
Total Multicast Groups Joined  :   2
```

Showing IGMP statistics for the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch# show ip igmp interface 1/1/5.10 statistics

IGMP statistics

Interface Name : 1/1/5.10
VRF Name       : default

Number of Include Groups       :   0
Number of Exclude Groups       :   2
Number of Static Groups        :   0
Total Multicast Groups Joined  :   2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp static-groups

```
show ip igmp static-groups [vrf <VRF-NAME> | all-vrfs] [vsx-peer]
```

Description

Shows IGMP static groups, or shows information by VRF.

Parameter	Description
`vrf <VRF-NAME> | all-vrfs`	Optional. Used to show information by VRF. Specify the VRF by VRF name. With no **`<VRF-NAME>`** specified, the default VRF is implied. Specify **all-vrfs** to show information for all VRFs.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP static-group information:

```
switch# show ip igmp static-groups

IGMP Static Group Address Information

VRF Name    default
Interface Name   Group Address
--------------- -----------------
vlan10            238.1.1.1
```

Showing IGMP statics-group information for all VRFs:

```
switch# show ip igmp static-groups all-vrfs

IGMP Static Group Address Information
VRF Name   :test
Interface Name   Group Address
--------------- -----------------
vlan20            239.1.1.1
VRF Name   :default
Interface Name   Group Address
--------------- -----------------
vlan10            238.1.1.1
```

```
Showing IGMP static-group information for VRF test:
                 switch# show ip igmp static-groups vrf test

IGMP Static Group Address Information

VRF Name   :test
Interface Name   Group Address
--------------- -----------------
vlan20            239.1.1.1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip igmp statistics

`show ip igmp statistics [vrf <VRF-NAME> | all-vrfs] [vsx-peer]`

Description

Shows IGMP statistics, including groups joined, or shows statistics by VRF.

Parameter	Description
`vrf <VRF-NAME> | all-vrfs`	Optional. Used to show information by VRF. Specify the VRF by VRF name. With no **`<VRF-NAME>`** specified, the default VRF is implied. Specify **all-vrfs** to show information for all VRFs.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP statistics:

```
switch# show ip igmp statistics
IGMP statistics

VRF Name        : default

Number of Include Groups       :   1
Number of Exclude Groups       :   0
Number of Static Groups        :   0
Total Multicast Groups Joined  :   1
```

Showing IGMP statistics for all VRFs:

```
switch# show ip igmp statistics all-vrfs
IGMP statistics
VRF Name        : test

Number of Include Groups       :   2
Number of Exclude Groups       :   0
Number of Static Groups        :   0
```

```
Total Multicast Groups Joined  :   2
VRF Name        : default

Number of Include Groups       :   1
Number of Exclude Groups       :   0
Number of Static Groups        :   0
Total Multicast Groups Joined  :   1
```

Showing IGMP statistics for VRF test:

```
switch# show ip igmp statistics vrf test
IGMP statistics

VRF Name        : test

Number of Include Groups       :   2
Number of Exclude Groups       :   0
Number of Static Groups        :   0
Total Multicast Groups Joined  :   2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 49

IGMP snooping commands

ip igmp snooping apply access list

```
ip igmp snooping apply access list <ACL-NAME>
no ip igmp snooping apply access list <ACL-NAME>
```

Description

Configures the access list (ACL) in a particular interface to filter IGMP join or leave packets based on rules set in a particular access list name. The **no** form of this command removes the configuration.

Parameter	Description
<ACL-NAME>	Specifies the access list name.

Usage

Existing classifier commands are used to configure ACL. In case of IGMPv3 packets with multiple group addresses received, only permitted group addresses based on the ACL rule set are proccessed. The packet is forwarded to querier and PIM router even though one of the groups present in the packet is blocked by ACL to avoid the delay in learning of the permitted groups because the access switch configured with the ACL blocks the traffic for the groups which are denied forwarding of joins have no impact. If all of the groups in a packet are denied by the ACL rule packet, it is not forwarded to the querier and PIM router. If the ACE has the source address configured, the source address in the IGMPv3 report is matched against the ACL and corresponding action is taken. Existing joins timeout.

With IGMPv2, if there is no match or if there is a deny rule match, the packet is dropped.

If the access list is configured for both L2 VLAN and L3 VLAN, then the L3 VLAN configuration is applied.

Example

Configure the access list:

```
switch(config)# vlan 2
switch(config-vlan-2)# ip igmp snooping apply access-list mygroup
```

Remove the access list:

```
switch(config)# vlan 2
switch(config-vlan-2)# no ip igmp snooping apply access-list mygroup
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ip igmp snooping (config mode)

```
ip igmp snooping
   drop-unknown vlan-shared|vlan-exclusive
   fastlearn <PORT-LIST>
```

Description

Configures drop-unknown and fastlearn modes on the ports. While IGMP snooping is enabled, the traffic will be forwarded only to ports that made an IGMP request for the multicast. Drop unknown filters ensure that packets are not forwarded to ports that did not make a request for the traffic stream. This could either be a filter across all VLANs (**vlan-shared**) or per VLAN (**vlan-exclusive**). The default is **vlan-shared**. Fast learn enables the port to learn group information when receiving a topology change notification. By default, fast learn is not enabled on ports.

Parameter	Description
`drop-unknown`	Drop unknown filters ensure that packets are not forwarded to ports that did not make a request for the traffic stream.
`vlan-shared`	Enables a shared VLAN filter on the switch. Default is **vlan-shared.**
`vlan-exclusive`	Enables an exclusive drop unknown filter per VLAN.
`fastlearn <PORT-LIST>`	Enable fast learn on ports. This parameter specifies a list of one or more ports to be configured as fast learn ports. You can specify a single port, a comma-separated list of ports or a range of ports such as 1/1/1-1/1/3. You may also enter an L2 LAG (1-128)
`no ...`	Negates any configured parameter.

Example

On the 6400 Switch Series, interface identification differs.

Configuring fast learn ports:

```
switch(config)# ip igmp snooping fastlearn 1/1/3
switch(config)# ip igmp snooping fastlearn 1/1/1-1/1/2
switch(config)# ip igmp snooping fastlearn 1/1/5,1/1/6
```

Configuring a shared VLAN filter on the switch:

```
switch(config)# ip igmp snooping drop-unknown vlan-shared
```

Configuring a exclusive drop unknown filter per VLAN:

```
switch(config)# ip igmp snooping drop-unknown vlan-exclusive
```

Disabling drop unknown on the switch:

```
switch(config)# no ip igmp snooping drop-unknown
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ip igmp snooping filter unknown mcast

```
ip igmp snooping filter-unknown-mcast
no ip igmp snooping filter-unknown-mcast
```

Description

Enables the avoidance of initial flooding of unknown multicast traffic on IGMP-snooping-enabled VLANs.

The no form of this command returns to the default behavior of initial flooding of unknown multicast traffic.

Usage

In the default behavior, the unknown multicast traffic is flooded until the IP Multicast Flow programming is done on the hardware. This is known as initial flooding of unknown multicast. Use this command to filter unknown multicast instead of flooding.

Initial flooding of multicast traffic is observed for a few seconds after the device comes up from a reboot. This issue is only seen when the multicast source connected device is rebooted. Once the device is up after a reboot, it takes a few seconds for the CPU Rx rule to be programmed during the timeframe that the initial flooding is observed. This is an expected behavior.

Example

Configure the unknown multicast to steal globally on IGMP snooping enabled VLANs.

```
switch# configure terminal
switch(config)# ip igmp snooping filter-unknown-mcast
```

Removing the configuration of the unknown multicast to steal globally on IGMP snooping enabled VLANs.

```
switch# configure terminal
switch(config)# no ip igmp snooping filter-unknown-mcast
```

Command History

Release	Modification
10.11	Command introduced on the 6200, 6300, 6400, 8100, and 8360.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ip igmp snooping (interface mode)

```
ip igmp snooping
   auto vlan <VLAN-LIST>
   blocked vlan <VLAN-LIST>
   fastleave vlan <VLAN-LIST>
   forced-fastleave vlan <VLAN-LIST>
   forward vlan <VLAN-LIST>
   no ...
```

Description

Configure IP IGMP snooping for the VLAN on the interface. When IGMP snooping is enabled, the L2 snooping switch forwards multicast packets of known multicast groups to only the receivers. When IGMP snooping is not enabled, the snooping switch floods multicast packets to all hosts on the VLAN.

Parameter	Description
`auto vlan` *`<VLAN-LIST>`*	Instruct the device to monitor incoming multicast traffic on the specified ports on a VLAN or VLAN range. This is the default behavior. Enter the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).
`blocked vlan` *`<VLAN-LIST>`*	Configures the specified ports in blocked mode for the specified VLAN list. In blocked mode, joins and traffic are always

Parameter	Description
	blocked on this port. Enter the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).
`fastleave vlan <VLAN-LIST>`	IGMP fastleave is configured for ports on a per-VLAN basis. Upon receiving a Leave Group message, the querier sends an IGMP Group-Specific Query message out of the interface to ensure that no other receivers are connected to the interface. If receivers are directly attached to the switch, it is inefficient to send the membership query as the receiver wanting to leave is the only connected host. When a fastleave-enabled switch port is connected to a single host and receives a leave, the switch does not wait for the querier status update interval, but instead immediately removes the IGMP client from its IGMP table and ceases transmitting multicast traffic to the client. (If the switch detects multiple end nodes on the port, Fastleave does not activate regardless of whether one or more of these end nodes are IGMP clients.) This processing speeds up the overall leave process and also eliminates the CPU overhead of having to generate an IGMP Group-Specific Query message. This parameter specifies a list of VLANs on which the port should be configured as a fastleave port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).
`forced-fastleave vlan <VLAN-LIST>`	With forced fastleave enabled, IGMP speeds up the process of blocking unnecessary multicast traffic to a switch port that is connected to multiple end nodes. When a port having multiple end nodes receives a leave group request from one end node for a given multicast group, forced fastleave activates and waits for a second to receive a join request from any other member of the same group on that port. If the port does not receive a join request for that group within the forced fastleave interval, the switch then blocks any further traffic to that group on that port. This parameter specifies a list of VLANs on which the port should be configured as a forced fastleave port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60). This command is available in **config-if** mode.
`forward vlan <VLAN-LIST>`	Configures the specified ports in forward mode in the given VLAN list. In forward mode, traffic is always forwarded on this port, irrespective of joins. Specify a list of VLANs on which the port should be configured as a forward port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60). This command is available in **config-if** mode.
`no ...`	Negates any configured parameter.

Example

On the 6400 Switch Series, interface identification differs.

Configure auto ports for VLAN on the interface:

```
switch# configure terminal
switch(config)# int 1/1/1
switch(config-if)# no shut
switch(config-if)# no routing
switch(config-if)# vlan trunk allowed 10-20
switch(config-if)# ip igmp snooping auto vlan 10
switch(config-if)# ip igmp snooping auto vlan 10-20
```

Configuring fastleave ports for the VLAN on the interface:

```
switch# configure terminal
switch(config)# int 1/1/1
switch(config-if)# no shut
switch(config-if)# no routing
switch(config-if)# vlan trunk allowed 10-20
switch(config-if)# ip igmp snooping fastleave vlan 10
switch(config-if)# ip igmp snooping fastleave vlan 10-20
```

Configuring blocked ports for the VLAN on the interface:

```
switch# configure terminal
switch(config)# int 1/1/1
switch(config-if)# no shut
switch(config-if)# no routing
switch(config-if)# vlan trunk allowed 10-20
switch(config-if)# ip igmp snooping blocked vlan 10
switch(config-if)# ip igmp snooping blocked vlan 10-20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ip igmp snooping preprogram-starg-flow

`ip igmp snooping preprogram-starg-flow {enable | disable}`

Description

Configures preprogramming of the starg flow feature on the IGMP snooping enabled VLAN.

Parameter	Description
`enable`	Enables preprogramming starg flows on the VLAN.
`disable`	Disables preprogramming starg flows on the VLAN.

Usage

When this feature is enabled, a summarized multicast bridge entry is programmed into the hardware table when an IGMPv2 or IGMPv3 join is received on the IGMP snooping enabled VLAN. This enables multicast flow to be programmed in the hardware before the data packet arrives for a multicast flow. If an unknown packet is received for a multicast flow, having this feature enabled triggers programming of starg entry in the hardware on selected platforms, which is helpful in optimizing hardware resource utilization and PIM registration in deployments where a L2 device is connected along the PIM registration path.

This feature is currently supported for IGMPv2 and IGMPv3 joins, so IGMPv3 joins that are sent for a specific source are treated as IGMPv2 joins and summarized entry is programmed in the corresponding hardware.

Preprogramming of starg flows is supported only on the IGMP snooping enabled VLANs. If IGMP snooping is disabled on a VLAN, this feature is auto-disabled.

This feature is currently supported for IGMPv2 and IGMPv3 joins, as a result, summarized multicast flow is programmed in advance when an IGMPv2 join or IGMPv3 join for a specific group is received. For IGMPv3 deployments, traffic from all sources for a specific multicast group is sent to all clients, regardless of whether they send IGMPv2 or IGMPv3 joins for this group. Keeping this feature disabled is recommended on VLANs where traffic from the specific source is only expected for the IGMPv3 clients.

On the 6200, 6300, 6400, 8100, and 8360 switch series, a single starg entry is programmed in advance for each join received. Data driven programming of SG entries does not occur when traffic is received from a specific source for this group. A single starg entry is used to forward the traffic to the clients for all of the active joins in the feature enabled VLANs.

When an unknown multicast packet is received on a VLAN where this feature is enabled, it triggers programming of a starg entry in the hardware instead of the SG.

It is highly recommended to not enable this feature on devices where PIM or L3 multicast routing is enabled as it can lead to issues like permanent traffic loss.

Configuring this feature on devices where there are multiple sources sending traffic for the same group address is recommended.

This feature is mutually exclusive with the IGMP snooping static group feature.

Example

Enable preprogramming multicast starg flows:

```
switch(config)# vlan 2
switch(config-vlan-2)# ip igmp snooping preprogram-starg flow enable
```

Disable preprogramming multicast starg flows:

```
switch(config)# vlan 2
switch(config-vlan-2)# ip igmp snooping preprogram-starg flow disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan`	Administrators or local user group members with execution rights for this command.

ip igmp snooping static group

```
ip igmp snooping static group <GROUP-NAME>
no ip igmp snooping static group <GROUP-NAME>
```

Description

Configures static multicast group. The **no** form of this command removes the configuration.

Parameter	Description
<GROUP-NAME>	Specifies the group name.

Example

Configure static multicast group on group 239.1.1.1:

```
switch(config)# vlan 2
switch(config-vlan-2)# ip igmp snooping static-group 239.1.1.1
```

Remove static multicast group on group 239.1.1.1:

```
switch(config)# vlan 2
switch(config-vlan-2)# no ip igmp snooping static-group 239.1.1.1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ip igmp snooping (vlan mode)

```
ip igmp snooping
   apply access-list <ACL-NAME>
   enable|disable
   no ...
   static-group <MULTICAST-IP-ADDRESS>
   version <2-3> (vlan interface mode)
```

Description

These commands enable or disable IP IGMP snooping on the VLAN, create IGMP snooping static multicast groups, set the IGMP snooping version and configurethe ACL on a particular interface.

Disabling and enabling IGMP snooping on a VLAN causes IGMP querier re-election.

Parameter	Description
`access-list`	Associates an ACL with the IGMP.
`enable|disable`	Enables or disables IGMP snooping on the VLAN. By default, IGMP snooping is disabled.
`no ...`	Negates any configured parameter.
`static-group` *`<MULTICAST-IP-ADDRESS>`*	This parameter configures an IGMP snooping static multicast group. Specify the IGMP static multicast group IP address in A.B.C.D format. You can configure a maximum of 32 IGMP snooping static
`version <2-3>`	Configures the IGMP snooping version on the VLAN. Select **2** for IGMPv2 (RFC2236). Select **3** for IGMPv3 (RFC3376).

Usage

- Existing classifier commands are used to configure the ACL.
- In case an IGMPv3 packet with multiple group addresses is received, the switch only processes the permitted group addresses based on the ACL rule set. The packet is forwarded to querier and PIM router even though one of the groups present in the packet is blocked by the ACL. This avoids the delay in learning of the permitted groups. Since the access switch configured with ACL blocks the traffic for the groups which are denied, forwarding of joins has no impact. If all the groups in the packet are denied by the ACL rule, the packet is not forwarded to the querier and PIM router. Existing joins will timeout.
- In case of IGMPv2, if there is no match or if there is a deny rule match, the packet is dropped.

If the access list is configured for both L2 VLAN and L3 VLAN, the L3 VLAN configuration will be applied.

Example

On the 6400 Switch Series, interface identification differs.

Enable IGMP snooping on a VLAN:

```
switch(config)# vlan 2
switch(config-vlan)# ip igmp snooping enable
```

Disable IGMP snooping on a VLAN:

```
switch(config)# vlan 2
switch(config-vlan)# ip igmp snooping disable
```

Configuring an IGMP snooping static group:

```
switch(config)# vlan 2
switch(config-vlan)# ip igmp snooping static-group 239.1.1.1
switch(config-vlan)# no ip igmp snooping static-group 239.1.1.1
```

Configuring IGMP snooping version on the VLAN:

```
switch(config)# vlan 2
switch(config-vlan)# ip igmp snooping version 2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

show ip igmp snooping

```
show ip igmp snooping
   counters
   detail
   groups [vlan <vlan-id>]
   no ...
   packet-exceptions
   static-groups
   statistics
```

```
vlan <vlan-id> [group {<ip-addr> [client_details]}|{port <IF-NAME>}|{vtep-peer
<A.B.C.D>}]
vsx-peer
```

NOTE: The `vsx-peer` parameter is not supported by the 6300 Series Switch

Description

Shows IGMP snooping configuration information and status for all VLANs. Specify a VLAN ID or a VLAN and a group to display details for only that VLAN or VLAN group.

Parameter	Description
`counters`	Shows IGMP query packets transmitted (Tx), received (Rx), and error packet counters.
`detail`	Shows IGMP Snooping details for all VLANs, including joined ports or VXLAN tunnel endpoints (VTEPs) for each group in the VLAN.
`groups`	Shows IGMP snooping groups information. Include the optional **vlan <vlan-id>** parameter to display information for groups on a specific VLAN.
`no ...`	Negates any configured parameter.
`packet-exceptions`	Troubleshoot issues in L2 multicast bridge entries for data packets forwarded to the CPU.
`static-groups`	Shows MLD snooping static group details, including the number of static groups joined.
`statistics`	Shows MLD snooping statistics.
`vlan <vlan-id>`	Shows IGMP snooping protocol information and number of different groups joined for the VLAN.
`group`	Shows IGMP snooping group information for the specified VLAN, including the number of different groups joined for the VLAN. Identify the group by IP address or interface name.
`<ip-addr> [client-details]`	Shows IGMP snooping group address information. Include the optional **client details** parameter to display IGMP snooping client details.
`port <IF-NAME>`	Shows IGMP snooping group information for the interface name in **member**/**slot**/**port** format.
`vtep-peer <A.B.C.D>`	Shows IGMP snooping info for the specified VTEP.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing IGMP snooping configuration and status:

```
switch# show ip igmp snooping

IGMP Snooping Protocol Info

Total VLANs with IGMP enabled             : 1
IGMP Drop Unknown Multicast               : Global


VLAN ID : 1
VLAN Name : DEFAULT_VLAN_1
IGMP Snooping is not enabled

VLAN ID : 2
VLAN Name : VLAN2
IGMP Configured Version : 3
IGMP Operating Version : 3
IGMP preprogram-starg-flow is operational
Querier Address [this switch] : 20.1.1.1
Querier Port :
Querier UpTime :0m 21s
Querier Expiration Time :0m 2s
```

Include the **detail** parameter for additional information on joined ports or VTEPs, as shown in the example below:

```
switch# show ip igmp snooping detail

IGMP Snooping Protocol Info

Total VLANs with IGMP enabled             : 1
Current count of multicast groups joined  : 4

IGMP Drop Unknown Multicast               : Global
VLAN ID : 100
VLAN Name : VLAN100
IGMP Configured Version : 3
IGMP Operating Version : 3
IGMP preprogram-starg-flow is not operational
Querier Address [this switch] : 15.1.1.1
Querier Port :
Querier UpTime :9m 32s
Querier Expiration Time :0m 10s
Router Detected Port(s) :

Active Group Address   Tracking  Vers Mode Uptime    Expires    Ports/Vteps
--------------------- ---------- ---- ---- --------- ---------- ------------------
------------
225.1.1.1              Filter    3    EXC  1m 2s     3m 19s
200.1.1.1,200.1.1.2
                                                                1/6/22
225.1.1.2              Filter    3    EXC  1m 2s     3m 19s
200.1.1.1,200.1.1.2
                                                                1/6/22
226.1.1.1              Filter    3    EXC  1m 4s     3m 16s     200.1.1.3
226.1.1.2              Filter    3    EXC  1m 4s     3m 16s     200.1.1.3
```

Showing IGMP snooping packet exceptions:

```
switch#  show ip igmp snooping packet-exceptions
List of L2 Multicast Bridge entries for which data packets are hitting CPU

VRF: default

Vlan   Group Address          Source-Address          Packet Count   Last Seen
Time
----   --------------------   ---------------------   ------------   -------------
------------
10     232.2.2.2/32           100.100.1.10/32         19             00h:02m:03s
10     232.2.2.3/32           100.100.1.10/32         42             01h:01m:59s
10     232.2.2.3/32           100.100.1.11/32         32             28d:10h:01m
20     232.2.2.2/32           50.1.1.10/32            31             01m:02w:01d
20     233.2.2.2/32           50.1.1.10/32            38
0001y:02m:02w:05d
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Programming starg flow is now supported.
10.10	The **packet-exceptions** parameter is introduced.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 50

In-System Programming commands

clear update-log

```
clear update-log
```

Description

Clears stored log files of any In-System Programming updates on the system.

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show needed-updates

```
show needed-updates [next-boot [primary|secondary]]
```

Description

Displays whether any programmable devices are in need of an update.

Without the **next-boot** parameter, this command displays needed updates relative to the currently running AOS-CX image.

With the **next-boot** parameter, this command displays needed updates relative to an AOS-CX image file in the persistent storage of the switch, which might be different from the currently running image. If either the **primary** or **secondary** parameter is specified, this command queries that specific AOS-CX image file. Otherwise, it queries the default AOS-CX image file as set by the most recent **boot system** or **boot set-default** command.

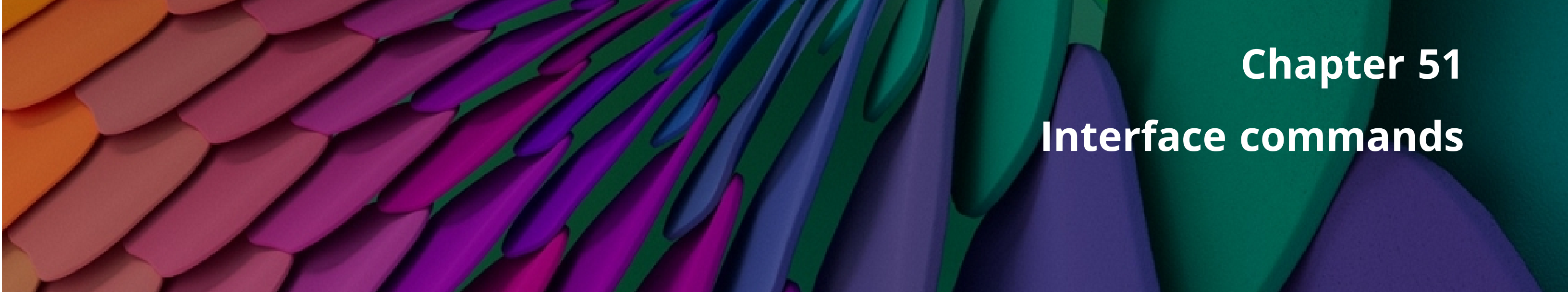
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 51
Interface commands

allow-unsupported-transceiver

```
allow-unsupported-transceiver [confirm | log-interval {none | <INTERVAL>}]
no allow-unsupported-transceiver
```

Description

Allows unsupported transceivers to be enabled or establish connections. Transceivers with speeds up to 100G are enabled by this command.

The following models will enable unsupported transceivers for speeds up to 100G when running AOS-CX 10.10 or later:

- 6300 Series Switches—Up to 50G
- 6400 Series Switches—Up to 100G

This command is enabled by default, allowing the use of third party transceiver products without adding the command in the configuration. Disabling this command with the **no** form will now disable the command in the running and stored configurations.

The **no** form of this command disallows using unsupported transceivers.

Parameter	Description
`confirm`	Specifies that unsupported transceiver warnings are to be automatically confirmed.
`log-interval none`	Disables unsupported transceiver logging.
`log-interval <INTERVAL>`	Sets the unsupported transceiver logging interval in minutes. Default: 1440 minutes. Range: 1440 to 10080 minutes.

Usage

When none of the parameters are specified it will display a warning message to accept the warranty terms. With **confirm** option the warning message is displayed but the user is not prompted to **(y/n)** answering. Warranty terms must be agreed to as part of enablement and the support is on best effort basis.

Examples

Allowing unsupported transceivers with follow-up confirmation:

```
switch(config)# allow-unsupported-transceiver
Warning: The use of unsupported transceivers, DACs, and AOCs is at your
own risk and may void support and warranty. Please see HPE Warranty terms
and conditions.

Do you agree and do you want to continue (y/n)? y
```

Allowing unsupported transceivers with confirmation in command syntax:

```
switch(config)# allow-unsupported-transceiver confirm
Warning: The use of unsupported transceivers, DACs, and AOCs is at your
own risk and may void support and warranty. Please see HPE Warranty terms
and conditions.
```

Configuring unsupported transceiver logging with an interval of every 48 hours:

```
switch(config)# allow-unsupported-transceiver log-interval 2880
```

Disabling unsupported transceiver logging:

```
switch(config)# allow-unsupported-transceiver log-interval none
```

Disallowing unsupported transceivers with follow-up confirmation:

```
switch(config)# no allow-unsupported-transceivers
Warning: Unsupported transceivers, DACs, and AOCs will be disabled,
which could impact network connectivity. Use 'show allow-unsupported-transceiver'
to identify unsupported transceivers, DACs, and AOCs.

Ccontinue (y/n)? y
```

Disallowing unsupported transceivers with confirmation in command syntax:

```
switch(config)# no allow-unsupported-transceiver confirm
Warning: Unsupported transceivers, DACs, and AOCs will be disabled,
which could impact network connectivity. Use 'show allow unsupported-transceiver'
to identify unsupported transceivers, DACs, and AOCs.

switch(config)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10	Up to 100G support enabled for unsupported transceivers on 6300 (up to 50G) and 6400 (up to 100G) series switches in UT mode.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

default interface

`default interface <INTERFACE-ID>`

Description

Sets an interface (or a range of interfaces) to factory default values.

Parameter	Description
<INTERFACE-ID>	Specifies the ID of a single interface or range of interfaces. Format: **member/slot/port** or **member/slot/port**-**member/slot/port** to specify a range.

Examples

On the 6400 Switch Series, interface identification differs.

Resetting an interface:

```
switch(config)# default default interface 1/1/1
```

Resetting an range of interfaces:

```
switch(config)# default default interface 1/1/1-1/1/10
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

description

```
description <DESCRIPTION>
no description
```

Description

Associates descriptive information with an interface to help administrators and operators identify the purpose or role of an interface.

The **no** form of this command removes a description from an interface.

Parameter	Description
<DESCRIPTION>	Specify a description for the interface. Range: 1 to 64 ASCII characters (including space, excluding question mark).

Examples

Setting the description for an interface to **DataLink 01**:

```
switch(config-if)# description DataLink 01
```

Removing the description for an interface.

```
switch(config-if)# no description
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

energy-efficient-ethernet

```
energy-efficient-ethernet
```

Description

Enables auto-negotiation of Energy-Efficient Ethernet (EEE) on an interface. EEE Negotiation is established only on auto-link negotiation with supported link partners.

Examples

Configuring an interface:

```
switch(config)# interface 1/1/1
switch(config-if)# energy-efficient-ethernet
```

Disabling Energy Efficient Ethernet on an interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no energy-efficient-ethernet
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

error-control

```
error-control {auto | none | base-r-fec | rs-fec}
no error-control {auto | none | base-r-fec | rs-fec}
```

Description

Configures the forward error correction (FEC) mode to use for an interface. When not configured, the system will automatically select the FEC mode based on the installed transceiver. In most cases, the standard FEC mode will work best, but certain link partners may require a non-standard mode.

The **no** and **auto** forms of this command configure the interface to automatically use the standard FEC mode of the currently installed transceiver.

FEC configuration only applies to transceivers, DACs, or AOCs running at 25G or 100G. 100G DACs are a special case. They can only set FEC to none when auto-negotiation is disabled through the **speed override** command. The default for the installed transceiver is used in all other cases.

Transceivers for which FEC is auto-negotiated will request the mode configured by this command, but may resolve to a different mode. The applied FEC mode is displayed as a commented line in the configuration shown with the **show run** command. It is also displayed with **show interface** command.

Parameter	Description
`auto`	Use the transceiver default.
`none`	Do not use any FEC.
`base-r-fec`	Use IEEE BASE-R (Firecode) FEC.
`rs-fec`	Use IEEE RS (Reed-Solomon) FEC.

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.11	Command enabled on 6400 and 8400 Switch Series.
10.08.1021	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

flow-control

```
flow-control rxtx
no flow-control rxtx
```

Description

Command **flow-control** enables negotiation of IEEE 802.3x link-level flow control on the current interface. The switch advertises link-level flow control support to the link partner. The final configuration is determined based on the capabilities of both partners.

Each invocation of this command replaces the previous configuration.

The **no** form of these commands disables any configured flow control on the selected interface.

Parameter	Description
`rxtx`	Enables the ability to honor received and to transmit IEEE 802.3x LLFC pause frames to the remote device.

Usage (flow control)

- For interfaces that auto-negotiate, link-level flow control is subject to negotiation, plus speed and other parameters. Both ends of the link must negotiate the same flow control mode for it to be applied.
- For interfaces that do not auto-negotiate, the configured link-level flow control mode is always applied and the user is responsible for ensuring that both ends of the link are configured for the same mode.
- All members of a LAG must have the same flow control configuration.
- Lossless flow control is only supported for single destination unicast traffic. Replicated traffic (for example, broadcast, multicast, mirroring) cannot be guaranteed to be lossless.
- Lossless behavior is not supported when operating in a VSF stack configuration.
- Lossless flow control will only operate correctly when both the ingress and egress interfaces have flow control enabled.

Examples

Enabling support for RXTX flow control:

```
switch(config)# interface 1/1/1
switch(config-if)# flow-control txrx
```

Disabling support for RXTX flow control:

```
switch(config)# interface 1/1/1
switch(config-if)# no flow-control txrx
```

hat use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

interface

`interface <PORT-NUM>`

Description

Switches to the **config-if** context for a physical port. This is where you define the configuration settings for the logical interface associated with the physical port.

Parameter	Description
<PORT-NUM>	Specifies a physical port number. Format: **member/slot/port**.

Examples

On the 6400 Switch Series, interface identification differs.

Configuring an interface:

```
switch(config)# interface 1/1/1
switch(config-if)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

interface loopback

```
interface loopback <ID>
no interface loopback <ID>
```

Description

Creates a loopback interface and changes to the **config-loopback-if** context. Loopback interfaces are layer 3.

The **no** form of this command deletes a loopback interface.

Parameter	Description
<INSTANCE>	Specifies the loopback interface ID. Range: 1 to 256

Examples

```
switch# config
switch(config)# interface loopback 1
switch(config-loopback-if)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

interface vlan

```
interface vlan <VLAN-ID>
no interface vlan <VLAN-ID>
```

Description

Creates an interface VLAN also know as an SVI (switched virtual interface) and changes to the **config-if-vlan** context. The specified VLAN must already be defined on the switch.

The **no** form of this command deletes an interface VLAN.

Parameter	Description
<VLAN-ID>	Specifies the loopback interface ID.
none	Do not reserve any internal VLANs.

Examples

```
switch# config
switch(config)# vlan 10
switch(config-vlan-10)# exit
switch(config)# interface vlan 10
switch(config-if-vlan)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ip address

```
ip address <IP-ADDR>/<MASK> [secondary]
no ip address <IP-ADDR>/<MASK> [secondary]
```

Description

Sets an IPv4 address for the current layer 3 interface.

The **no** form of this command removes the IPv4 address from the interface.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address **192.169.005.100** becomes **192.168.5.100**.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`secondary`	Specifies a secondary IP address.

Examples

On the 6400 Switch Series, interface identification differs.

Creating a layer 3 interface setting its IP address to **192.168.100.1** with a mask of **24** bits.

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# ip address 192.168.100.1/24
```

Assigning the IP address **192.168.20.1** with a mask of **24** bits to loopback interface **1**:

```
switch(config)# interface loopback 1
switch(config-loopback-if)# routing
switch(config-loopback-if)# ip address 192.168.20.1/24
```

Assigning the IP address **192.168.199.1** with a mask of **24** bits to interface VLAN **10**:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# ip address 192.168.199.1/24
```

Removing the IP address **192.168.199.1** with a mask of **24** bits from interface VLAN **10**:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no ip address 192.168.199.1/24
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if`
	`config-loopback-if`
	`config-if-vlan`
		Administrators or local user group members with execution rights for this command.

ip mtu

```
ip mtu <VALUE>
```

```
no ip mtu
```

Description

Sets the IP MTU (maximum transmission unit) for an interface. This defines the largest IP packet that can be sent or received by the interface. This value should be less than or equal to the overall MTU for the interface.

The **no** form of this command sets the IP MTU to the default value 1500. This command is only allowed when routing is enabled on the interface.

Parameter	Description
<VALUE>	Specifies the IP MTU in bytes. Range: 68 to 9198. Default: 1500.

Usage

The IP MTU value for subinterface must be less than or equal to the parent MTU for the subinterface. The subinterface uses its IP MTU value and not the parent IP MTU value.

Examples

Setting the IP MTU to 576 bytes:

```
switch(config-if)# ip mtu 576
```

Setting the IP MTU to the default value:

```
switch(config-if)# no ip mtu
```

Setting the IP MTU value on a subinterface:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip mtu 6000
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Subinterface support added.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if config-if-vlan config-subif	Administrators or local user group members with execution rights for this command.

ipv6 address

```
ipv6 address <IPV6-ADDR>/<MASK>{eui64 | [tag <ID>]}
no ipv6 address <IPV6-ADDR>/<MASK>
```

Description

Sets an IPv6 address on the interface.

The **no** form of this command removes the IPv6 address on the interface.

This command automatically creates an IPv6 link-local address on the interface. However, it does not add the **ipv6 address link-local** command to the running configuration. If you remove the IPv6 address, the link-local address is also removed. To maintain the link-local address, you must manually execute the **ipv6 address link-local** command.

Parameter	Description
<IPV6-ADDR>	Specifies the IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. You can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a hextet of four zeros to a single 0. For example, this address **2222:0000:3333:0000:0000:0000:4444:0055** becomes **2222:0:3333::4444:55**.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
eui64	Configure the IPv6 address in the EUI-64 bit format.
tag *<ID>*	Configure route tag for connected routes. Range: 0 to 4294967295. Default: 0.

Examples

Setting the IPv6 address **2001:0db8:85a3::8a2e:0370:7334** with a mask of 24 bits:

```
switch(config-if)# ipv6 address 2001:0db8:85a3::8a2e:0370:7334/24
```

Removing the IP address **2001:0db8:85a3::8a2e:0370:7334** with mask of 24 bits:

```
switch(config-if)# no ipv6 address 2001:0db8:85a3::8a2e:0370:7334/24
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if	Administrators or local user group members with execution rights for this command.

l3-counters

```
l3-counters [rx | tx]
no l3-counters [rx | tx]
```

Description

Enables counters on a layer 3 interface. By default, all interfaces are layer 3. To change a layer 2 interface to layer 3, use the **routing** command.

The **no** form of this command, with no specification, disables both transmit and receive counters on a layer 3 interface. To disable transmit (**tx**) or receive (**rx**) counters only, specify the counter type you want to disable.

Parameter	Description
`rx`	Specifies receive counters.
`tx`	Specifies transmit counters.

Examples

Enabling layer 3 transmit counters

On the 6300 Switch Series:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# l3-counters
```

On the 6400 Switch Series:

```
switch(config)# interface 1/3/1
switch(config-if)# routing
switch(config-if)# l3-counters
```

Enabling layer 3 transmit counters on subinterfaces

On the 6300 Switch Series:

```
switch(config)# interface 1/1/1.10
switch(config-if)# routing
switch(config-if)# l3-counters tx
```

On the 6400 Switch Series:

```
switch(config)# interface 1/3/1.10
switch(config-if)# routing
switch(config-if)# l3-counters tx
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Added support for 13 counters on subinterfaces
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-subif`	Administrators or local user group members with execution rights for this command.

mtu

```
mtu <VALUE>
no mtu
```

Description

Sets the MTU (maximum transmission unit) for an interface. This defines the maximum size of a layer 2 (Ethernet) frame. Frames larger than the MTU (1500 bytes by default) are dropped and cause an ICMP fragmentation-needed message to be sent back to the originator.

To support jumbo frames (frames larger than 1522 bytes), increase the MTU as required by your network. A frame size of up to 9198 bytes is supported.

The largest possible layer 1 frame will be 18 bytes larger than the MTU value to allow for link layer headers and trailers.

The **no** form of this command sets the MTU to the default value 1500.

Parameter	Description
<VALUE>	Specifies the MTU in bytes. Range: 46 to 9198. Default: 1500.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the MTU on interface **1/1/1** to 1000 bytes:

```
switch(config)# interface 1/1/1
switch(config-if)# no routing
switch(config-if)# mtu 1000
```

Setting the MTU on interface **1/1/1** to the default value:

```
switch(config)# interface 1/1/1
switch(config-if)# no routing
switch(config-if)# no mtu
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

persona

```
persona {access | uplink | custom <PERSONA-NAME>} [copy | attach]
no persona {access | uplink | custom <PERSONA-NAME>} [copy | attach]
```

Description

Associates one of three persona types with an interface to classify the purpose or role of an interface. On the 10000 Switch Series, “access” persona ports are typically connected to workloads / VMs, and the “uplink” (fabric) persona ports are connected to the core / spine.

The **no** form of this command removes the interface persona.

Parameter	Description
`access`	Selects the **access** persona type.
`uplink`	Selects the **uplink** persona type.
`custom <PERSONA-NAME>`	Selects the **custom** persona type with a user-provided name. Range: 1 to 64 printable ASCII characters including space.
`copy`	Specifies the mode: copies settings from the persona interface of the same name.
`attach`	Specifies the mode: attaches the specified interface to the persona interface of the same name.

Usage

- If the mode is specified, either copy or attach, the interface configuration is dependent on the interface template whose name is "access", "uplink", or "<*PERSONA-NAME*>". On the other hand, if the mode is not specified, then the persona is just a label in the interface, and its configuration is not modified even if the interface persona exists. When configuring the mode, one of the following options is possible:

    - The **copy** option performs a one-time copy of the template interface. Subsequent changes to the template are not copied and the 'persona' setting is just a label. If the mode is set to **copy** and the interface persona does not exist, then the CLI command fails with the message "Interface persona not found".
    - The **attach** option performs a copy of the template interface, and subsequent changes to the template interface configuration are immediately applied to all attached interfaces. The template interface does not need to exist before attaching other interfaces to it. After attaching a template, the copied settings can be modified for an individual interface. However, any change in the attached template will overwrite the modified values with the new template values.
- When a mode is specified, it should match an interface created with the command interface persona <*PERSONA-NAME*>. The only exception to this rule is when the mode is set to `attach` and the persona does not already exist.
- The mode is only available to be configured for an interface that meets the following conditions:
    - IS a physical interface
    - IS NOT a LAG member
    - IS NOT a persona interface

Examples

Configuring an access persona:

```
switch(config)# interface 1/1/1
switch(config-if)# persona access
```

Configuring an uplink persona:

```
switch(config)# interface 1/1/1
switch(config-if)# persona uplink
```

Configuring a custom persona named "mypersona":

```
switch(config)# interface 1/1/1
switch(config-if)#persona custom mypersona
```

Removing the persona setting.

```
switch(config-if)# no persona
```

Copying a predefined persona name configuration to an interface:

1. Configuring the interface persona:

```
switch(config)# interface persona uplink
switch(config-if)# no shutdown
switch(config-if)# no routing
switch(config-if)# vlan access 100
switch(config-if)# exit
```

2. Applying the configuration from the persona named "mypersona" with **copy** mode:

```
switch(config)# interface 1/1/1
switch(config-if)# persona custom mypersona copy
switch(config-if)# exit
```

Attaching a custom persona name named "mypersona" to several interfaces simultaneously:

1. Configuring an interface persona named "mypersona":

```
switch(config)# interface persona mypersona
switch(config-if)# no shutdown
switch(config-if)# vrf attach upstream
switch(config-if)# exit
```

2. Applying the "mypersona" configuration with **attach** mode:

```
switch(config)# interface 1/1/1-1/1/24
switch(config-if)# persona custom mypersona attach
switch(config-if)# exit
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10	Added optional parameters: attach, copy.
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

rate-interval

```
rate-interval <VALUE>
no rate-interval
```

Description

This command sets the time interval to calculate interface rates. Lower intervals are more useful for detecting traffic bursts, but may increase computation load to the overall system. Intervals must be a multiple of five seconds. The command-line interface will not accept a rate interval value that is not a multiple of five.

The **no** form of this command sets the rate collection interval to the default value of 300 seconds.

Parameter	Description
<VALUE>	The statistics rate collection interval in seconds. The supported range is 5-300 seconds, where the number of seconds is a multiple of five. **NOTE:** The supported range for 6400 and 8400 switch series is 30 - 300 seconds.

Examples

Setting the rate collection interval to 50 seconds

```
switch(config)# interface 1/1/1
switch(config-if)# rate-interval 50
```

Setting the rate collection interval to the default value:

```
switch(config-if)# no rate-interval
```

The following example shows the command-line interface warning that appears while configuring an invalid rate-interval.

```
switch(config)# interface 1/1/1
switch(config-if)# rate interval 6
The interval must be a multiple of 5.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Usage

The rate collection interval must be configured in the multiples of 5. Any other value will be rejected and the CLI will display the error message, **The interval must be a multiple of 5.**

Command History

Release	Modification
10.12.1000	Command supported on all platforms.
10.12	Command Introduced on 6300 and 8360 Switch series.

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

routing

```
routing
no routing
```

Description

Enables routing support on an interface, creating a L3 (layer 3) interface on which the switch can route IPv4/IPv6 traffic to other devices.

By default, routing is disabled on all interfaces.

The **no** form of this command disables routing support on an interface, creating a L2 (layer 2) interface.

If you enable this configuration, collection of flow tracking statistics is disabled.

Examples

Enabling routing support on an interface:

```
switch(config-if)# routing
```

Disabling routing support on an interface:

```
switch(config-if)# no routing
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show allow-unsupported-transceiver

```
show allow-unsupported-transceiver
```

Description

Displays configuration and status of unsupported transceivers.

Examples

Showing unallowed unsupported transceivers:

```
switch(config)# show allow-unsupported-transceiver
Allow unsupported transceivers : no
Logging interval               : 1440 minutes
---------------------------------------------
Port       Type           Status
---------------------------------------------
1/1/31     SFP-SX         unsupported
1/1/32     SFP-1G-BXD     unsupported
1/1/2      SFP28DAC3      unsupported
```

Showing allowed unsupported transceivers:

```
switch# show allow-unsupported-transceiver
Allow unsupported transceivers : yes
Logging interval               : 1440 minutes
---------------------------------------------
Port       Type           Status
---------------------------------------------
1/1/31     SFP-SX         unsupported-allowed
1/1/32     SFP-1G-BXD     unsupported-allowed
1/1/2      SFP28DAC3      unsupported
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

show interface

```
show interface [<IFNNAME>|<IFRANGE>] [brief | physical]
show interface [<IFNNAME>|<IFRANGE>] [extended [non-zero] | [human-readable]]
show interface [<IFNNAME>] monitor [human-readable]
show interface [lag | loopback | tunnel | vlan ] [<ID>] [brief]
show interface lag [<LAG-ID>] [extended [non-zero] | [human-readable]]
show interface lag [<LAG-ID>] monitor [human-readable]
```

Description

Shows active configurations and operational status information for interfaces.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.
brief	Shows brief info in tabular format.
physical	Shows the physical connection info in tabular format.
extended	Shows additional statistics, including the **tx filtered** and **rx filtered** counters. ▪ Rx filter packets are protocol packets received when the protocol is disabled on the switch and there is only one port in the VLAN. Protocols include OSPF, PIM, RIP, LACP, and LLDP. ▪ An example of a Tx filtered packet would be a multicast packet being filtered from going out of the ingress port.
human-readable	Shows statistics rounded to the nearest power of 1000, for example, 1K, 345M, 2G. This is available only in the CLI interface output.
non-zero	Shows only non zero statistics.
LAG	Shows LAG interface information.
monitor	Continuously monitor interface statistics.
LOOPBACK	Shows loopback interface information.
TUNNEL	Shows tunnel interface information.
VLAN	Shows VLAN interface information.
<LAG-ID>	Specifies the LAG number. Range: 1-256
<LOOPBACK-ID>	Specifies the LOOPBACK number. Range: 0-255
<TUNNEL-ID>	Specifies the tunnel ID. Range: 1-255
<VLAN-ID>	Specifies the VLAN ID. Range: 1-4094
VXLAN	Shows the VXLAN interface information.
<VXLAN-ID>	Specifies the VXLAN interface identifier. Default: 1

Examples

Showing interface information when it is configured as a route-only port:

```
switch# show interface 1/1/1
Interface 1/1/1 is up
Admin state is up
Link state: up for 2 days (since Sun Jun 21 05:30:22 UTC 2020)
Link transitions: 1
Description: backup data center link
Hardware: Ethernet, MAC Address: 70:72:cf:fd:e7:b4
```

```
MTU 1500
Type 1GbT
Full-duplex
qos trust none
Speed 1000 Mb/s
Auto-negotiation is on
Flow-control: off
Error-control: off
Energy-Efficient Ethernet is enabledMDI mode: MDIX
L3 Counters: Rx Enabled, Tx Enabled
Rate collection interval: 300 seconds
Rates                           RX                   TX        Total (RX+TX)
------------- -------------------- -------------------- --------------------
Mbits / sec                   0.00                 0.00                 0.00
KPkts / sec                   0.00                 0.00                 0.00
Unicast                       0.00                 0.00                 0.00
Multicast                     0.00                 0.00                 0.00
Broadcast                     0.00                 0.00                 0.00
Utilization %                 0.00                 0.00                 0.00
Statistics                      RX                   TX                Total
------------- -------------------- -------------------- --------------------
Packets                          0                    0                    0
Unicast                          0                    0                    0
Multicast                        0                    0                    0
Broadcast                        0                    0                    0
Bytes                            0                    0                    0
Jumbos                           0                    0                    0
Dropped                          0                    0                    0
Filtered                         0                    0                    0
Pause Frames                     0                    0                    0
L3 Packets                       0                    0                    0
L3 Bytes                         0                    0                    0
Errors                           0                    0                    0
CRC/FCS                          0                  n/a                    0
Collision                      n/a                    0                    0
Runts                            0                  n/a                    0
Giants                           0                  n/a                    0
Other                            0                    0                    0
```

Showing information when the interface is currently linked at a downshifted speed:

```
switch(config-if)# show interface 1/1/1
Interface 1/1/1 is up
...
Auto-negotiation is on with downshift active
```

Showing information when the interface is currently linked with energy-efficient-ethernet negotiated:

```
switch(config-if)# show interface 1/1/1
Interface 1/1/1 is up
...
Energy-Efficient Ethernet is enabled and active
```

Showing information when the interface is shut down during a VSX split:

```
switch(config-if)# show interface 1/1/1
Interface 1/1/1 is down
Admin state is up
State information: Disabled by VSX
Link state: down for 3 days (since Tue Mar 16 05:20:47 UTC 2021)
Link transitions: 0
Description:
Hardware: Ethernet, MAC Address: 04:09:73:62:90:e7
MTU 1500
Type SFP+DAC3
Full-duplex
qos trust none
Speed 0 Mb/s
Auto-negotiation is off
Flow-control: off
Error-control: off
VLAN Mode: native-untagged
Native VLAN: 1
Allowed VLAN List: 1502-1505
Rate collection interval: 300 seconds

Rate                               RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
Mbits / sec                      0.00                 0.00                 0.00
KPkts / sec                      0.00                 0.00                 0.00
Unicast                          0.00                 0.00                 0.00
Multicast                        0.00                 0.00                 0.00
Broadcast                        0.00                 0.00                 0.00
Utilization                      0.00                 0.00                 0.00

Statistic                          RX                   TX                Total
---------------- -------------------- -------------------- --------------------
Packets                             0                    0                    0
Unicast                             0                    0                    0
Multicast                           0                    0                    0
Broadcast                           0                    0                    0
Bytes                               0                    0                    0
Jumbos                              0                    0                    0
Dropped                             0                    0                    0
Pause Frames                        0                    0                    0
Errors                              0                    0                    0
CRC/FCS                             0                  n/a                    0
Collision                         n/a                    0                    0
Runts                               0                  n/a                    0
Giants                              0                  n/a                    0
```

Showing information when the interface is configured with EEE and the EEE has auto-negotiated:

```
switch(config-if)# show interface 1/1/1 physical
----------------------------------------------------------------------------------
----------------------------------------------------------
                            Link    Admin         Speed           Flow-Control
     EEE       PoE Power                      Port
Port        Type           Status   Config   Status | Config    Status | Config
Status | Config  (Watts)    State Information  Description
----------------------------------------------------------------------------------
----------------------------------------------------------
1/1/1       1GbT           up       up       1G       auto      off      off
on       on       --        10M/100M/1G        --
```

Showing the monitor information:

In monitor mode, the CLI refreshes data automatically until it is exited by entering **q**. Pressing **?** opens the help menu to display which options are available in this context.

```
Interface 1/1/1 is up
Rate                               RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
MBits / sec                  30196.43             30196.43             60392.85
MPkts / sec                  58977.39             58977.40            117954.79
Unicast                          0.00                 0.00                 0.00
Multicast                    58977.39             58977.40            117954.79
Broadcast                        0.00                 0.00                 0.00
Utilization %                   75.49                75.49               150.98
Statistic                          RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
Packets                    4756527649           4756527865           9513055514
Unicast                             0                    0                    0
Multicast                  4756527649           4756527865           9513055514
Broadcast                           2                    0                    2
Bytes                    304417778668         304417795428         608835574096
Jumbos                              0                    0                    0
Dropped                             0          19028847730          19028847730
Pause Frames                        0                    0                    0
Errors                              0                    0                    0
CRC/FCS                             0                  n/a                    0
help: ?, quit: q
```

```
Help for Interface Monitor
h  Toggle human-readable mode
c  Clear interface statistics
Does not apply to rates
Arrows, PgUp, PgDn, Home, End
Navigate interface statistics
Delay: 2
help: ?, quit: q
```

Showing the output for interface 1/1/1 in human-readable format:

In human-readable format, the **< 1** symbol for **Utilization** indicates that the amount of packets is between zero and one. This is true in cases where the number of bytes increases but the number of packets and the **Utilization** value is not displayed even in the normal output, where the human-readable parameter is not included in the command.

```
switch(config-if)# show interface 1/1/1 human-readable
Interface 1/1/1 is up
Rate                               RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
Bits / sec                         3M                   3M                   6M
Pkts / sec                        316                  316                  633
Unicast                           319                  319                  638
Multicast                           0                    0                    0
Broadcast                           0                    0                    0
Utilization %                     < 1                  < 1                  < 1
Statistic                          RX                   TX                Total
---------------- -------------------- -------------------- --------------------
Packets                          577K                 577K                   1M
```

```
Unicast                          577K                 577K                   1M
Multicast                           0                   51                   51
Broadcast                           0                   15                   15
Bytes                            744M                 745M                   1G
Jumbos                              0                    0                    0
Dropped                             0                    0                    0
Filtered                            0                    0                    0
Pause Frames                        0                    0                    0
Errors                              0                    0                    0
CRC/FCS                             0                  n/a                    0
Collision                         n/a                    0                    0
Runts                               0                  n/a                    0
Giants                              0                  n/a                    0
```

Showing information about extended counters:

The output of the `show interface extended` command varies depending on the switch model and configuration.

```
switch(config-if)# show interface 1/1/17 extended
-------------------------------------------------------------------
Interface 1/1/17
-------------------------------------------------------------------
Statistics                                      Value
-------------------------------------------------------------------
Dot1d Tp Port In Frames                         547
Dot1d Tp Port Out Frames                        608
Dot3 In Pause Frames                            0
Dot3 Out Pause Frames                           0
Ethernet Stats Broadcast Packets                19
Ethernet Stats Bytes                            40162
Ethernet Stats Packets                          342
...
-------------------------------------------------------------------
Error-Statistics                                Value
-------------------------------------------------------------------
Dot1d Base Port MTU Exceeded Discards           0
Dot3 Control In Unknown Opcodes                 0
Dot3 Stats Alignment Errors                     0
Dot3 Stats FCS Errors                           0
Dot3 Stats Frame Too Longs                      0
Dot3 Stats Internal Mac Transmit Errors         0
Ethernet RX Oversize Packets                    0
...
```

Showing interface link-status:

```
switch# show interface link-status
-------------------------------------------------------------


Port           Type           Physical    Link         Last
                              Link State  Transitions  Change
-------------------------------------------------------------
1/1/1          1G-BT          down        0            --
1/1/2          1G-BT          up          1            1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
```

```
1/1/3          1G-BT          up          1           1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
1/1/4          --             down        0           --
1/1/5          --             down        0           --
```

Showing interface loopback 1 link-status:

```
--------------------------------------------------------------
                              Physical    Link         Last
Port           Type           Link State  Transitions  Change
--------------------------------------------------------------
loopback1      --             up          --           --
```

Showing interface 1/1/2-1/1/3 link-status:

```
--------------------------------------------------------------
                              Physical    Link         Last
Port           Type           Link State  Transitions  Change
--------------------------------------------------------------
1/1/2          1G-BT          up          1            1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
1/1/3          1G-BT          up          1            1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
```

Showing interface link-status:

```
switch# show interface link-status
--------------------------------------------------------------------------
Port           Type            Physical    Link        Link Flaps  Last
                               Link State  Transitions Ignored     Change
--------------------------------------------------------------------------
1/1/1          1G-BT           down        0           0           --
1/1/2          1G-BT           up          1           0           1 minute ago
(Fri Mar 09 12:36:56 UTC 2018)
1/1/3          1G-BT           up          1           0           1 minute ago
(Fri Mar 09 12:36:56 UTC 2018)
1/1/4          --              down        0           0           --
1/1/5          --              down        0           0           --
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.11	Added `monitor` parameter.
10.10	Added `human-readable` parameter.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface dom

```
show interface [<INTERFACE-ID>] dom [detail] [vsx-peer]
```

Description

Shows diagnostics information and alarm/warning flags for the optical transceivers (SFP, SFP+, QSFP+). This information is known as DOM (Digital Optical Monitoring). DOM information also consists of vendor determined thresholds which trigger high/low alarms and warning flags.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: **member/slot/port**.
detail	Show detailed information.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

```
switch# show interface dom
--------------------------------------------------------------------------------
Port     Type       Channel  Temperature Voltage  Tx Bias  Rx Power       Tx Power
                             (Celsius)   (Volts)  (mA)     (mW/dBm)       (mW/dBm)
--------------------------------------------------------------------------------
1/1/1    SFP+SR              47.65       3.31     8.40     0.08, -10.96   0.63, -2.49
1/1/2    SFP+SR              n/a         n/a      n/a      n/a            n/a
1/1/3    SFP+DA3             42.10       3.24     n/a      n/a            n/a
1/1/4    QSFP+SR4   1        44.46       3.30     6.12     0.08, -10.96   0.63, -1.95
2                            44.46       3.30     6.04     0.08, -10.96   0.63, -2.00
3                            44.46       3.30     6.51     0.08, -10.96   0.60, -2.16
4                            44.46       3.30     6.19     0.08, -10.96   0.63, -1.94
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface energy-efficient ethernet

`show interface [<IFNAME>|<IFRANGE>] energy-efficient-ethernet`

Description

Displays Energy-Efficient Ethernet information for the interface.

Parameter	Description
<IFNAME>	Specifies the name of an interface on the switch. Use the format **member/slot/port** (for example, **1/1/1**).
<IFRANGE>	Specifies the port identifier range of an interface on the switch. Use the format **member/slot/port** (for example, **1/1/1**).

Example

The following example shows when the interfaces are Energy-Efficient Ethernet capable.

```
switch# show interface energy-efficient-ethernet
-------------------------------------------------------------------
Port     Enabled    Negotiated    Speed       TX Wake     RX Wake
                                  (MB/s)      Time(us)    Time (us)
-------------------------------------------------------------------
1/1/1    no         no            --          --          --
1/1/2    yes        yes           100         36          36
1/1/3    yes        yes           1000        17          17
1/1/4    no         no            --          --          --
1/1/5    yes        no            1000        --          --
```

The following example shows when the interface is not Energy-Efficient Ethernet capable :

```
switch# show interface 1/1/1 energy-efficient-ethernet
Port 1/1/1 does not support Energy-Efficient-Ethernet
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface flow-control

`show interface [<IFNNAME>|<IFRANGE>] flow-control [detail]`

Description

Shows the flow control configuration, status, and statistics of the specified interface for interfaces on which flow control is enabled.

If **detail** is not specified, this command shows a summary of all flow controlled interfaces with one interface per line. If **detail** is specified, this command shows flow control detailed statistics.

As of AOS-CX 10.10, the separate **show flow-control** command has been removed, with it being effectively replaced by this command.

Parameter	Description
<IFNNAME>|*<IFRANGE>*	Specifies the interface (port) name or range. When no interface range is specified, only interfaces with flow control enabled in the configuration or status are shown.
`detail`	Shows detailed information.

Examples

Showing summary flow control information:

```
switch# show interface flow-control
----------- -------------------------------------
Port        Flow
            Control
----------- -------------------------------------
1/1/1       config: llfc rx
            status: llfc rx
1/1/2       config: llfc rx
            status: none
```

Showing summary flow control information with PFC:

```
switch# show interface flow-control
----------- -------------------------------------
Port        Flow
            Control
----------- -------------------------------------
```

```
1/1/1       config: pfc rxtx-1,2
            status: pfc rxtx-1,2
1/1/2       config: pfc rxtx-5
            status: none
```

Showing summary flow control information with PFC:

```
switch# show interface flow-control
  Flow Control Watchdog Settings
      Trigger Timeout:  100 milliseconds
      Resume Time:      100 milliseconds
----------- ------------------------------------- ------------- --------
Port        Flow                                  Watchdog      Watchdog
            Control                               Status        Timeouts
----------- ------------------------------------- ------------- --------
1/1/1       config: llfc rx
            status: llfc rx
1/1/2       config: llfc rx                       incompatible         0
            status: llfc rx
1/1/10      config: pfc rxtx-1,2                  enabled           1234
            status: pfc rxtx-1,2
1/1/12      config: pfc rxtx-1,2                  error                0
            status: pfc rxtx-1,2
1/1/32:4    config: pfc rxtx-5
            status: pfc rxtx-5
```

Showing summary flow control information where the configuration does not match status due to a reboot required to apply PFC configuration in hardware:

```
switch# show interface flow-control

 Flow Control Watchdog Settings
   Trigger Timeout:  100 milliseconds (actual: not applied)
   Resume Time:      100 milliseconds (actual: not applied)

 ----------- ------------------------------------- ------------- --------
 Port        Flow                                  Watchdog      Watchdog
             Control                               Status        Timeouts
 ----------- ------------------------------------- ------------- --------
 1/1/1       config: llfc rx
             status: llfc rx
 1/1/2       config: llfc rx                       incompatible         0
             status: llfc rx
 1/1/10      config: pfc rxtx-1,2                  pending           1234
             status: none
 1/1/12      config: pfc rxtx-1,2                  pending              0
             status: none
 1/1/32:4    config: pfc rxtx-5
             status: none
```

Showing detailed flow control information with RX flow control enabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
```

```
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: llfc rx

 Statistics                             RX
 -------------------- --------------------
 Dot3 Pause Frames                         0
```

Showing detailed flow control information with RX flow control enabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: llfc rx
 Flow-control watchdog: disabled

 Statistics                             RX
 -------------------- --------------------
 Dot3 Pause Frames                         0
```

Showing detailed flow control information with RXTX flow control enabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: llfc rxtx

 Statistics                             RX                   TX
 -------------------- -------------------- --------------------
 Dot3 Pause Frames                         0                    0
```

Showing detailed flow control information with PFC enabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: pfc rxtx-4,5

 Statistics                             RX                   TX
 -------------------- -------------------- --------------------
 Priority 0 Pauses                         0                    0
 Priority 1 Pauses                         0                    0
 Priority 2 Pauses                         0                    0
 Priority 3 Pauses                         0                    0
 Priority 4 Pauses                         0                    0
 Priority 5 Pauses                         0                    0
 Priority 6 Pauses                         0                    0
 Priority 7 Pauses                         0                    0
 Total Pause Frames                        0                    0
```

Showing detailed flow control information with PFC enabled and flow control watchdog disabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: pfc rxtx-4,5
 Flow-control watchdog: disabled

 Statistics                             RX                   TX
 -------------------- -------------------- --------------------
 Priority 0 Pauses                       0                    0
 Priority 1 Pauses                       0                    0
 Priority 2 Pauses                       0                    0
 Priority 3 Pauses                       0                    0
 Priority 4 Pauses                       0                    0
 Priority 5 Pauses                       0                    0
 Priority 6 Pauses                       0                    0
 Priority 7 Pauses                       0                    0
 Total Pause Frames                      0                    0
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: pfc rxtx-4,5
 Flow-control watchdog: disabled

 Statistics                             RX                   TX
 -------------------- -------------------- --------------------
 Priority 0 Pauses                       0                    0
 Priority 1 Pauses                       0                    0
 Priority 2 Pauses                       0                    0
 Priority 3 Pauses                       0                    0
 Priority 4 Pauses                       0                    0
 Priority 5 Pauses                       0                    0
 Priority 6 Pauses                       0                    0
 Priority 7 Pauses                       0                    0
 Total Pause Frames                      0                    0
```

Showing detailed flow control information with both PFC and flow control watchdog enabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: pfc rxtx-4,5
 Flow-control watchdog: enabled

 Statistics                             RX                   TX
 -------------------- -------------------- --------------------
 Priority 0 Pauses                       0                    0
 Priority 1 Pauses                       0                    0
 Priority 2 Pauses                       0                    0
 Priority 3 Pauses                       0                    0
 Priority 4 Pauses                       0                    0
 Priority 5 Pauses                       0                    0
 Priority 6 Pauses                       0                    0
 Priority 7 Pauses                       0                    0
 Total Pause Frames                      0                    0
 Queue        Watchdog Timeouts
 ------------ -----------------
 Queue 0                      0
 Queue 1                      0
 Queue 2                      0
 Queue 3                      0
 Queue 4                      0
 Queue 5                      0
 Queue 6                      0
 Queue 7                      0
```

Showing detailed flow control information when flow control watchdog is enabled in the configuration but it could not be applied because the configured flow control mode is not compatible with watchdog:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: llfc rx
 Flow-control watchdog: incompatible
```

Showing detailed flow control information when flow control watchdog is enabled in the configuration but could not be applied because a compatible flow control mode first requires a reboot:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: off
 Flow-control watchdog: pending
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10	Examples updated with new and changed output elements.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface statistics

```
show interface [<IFNAME>|<IFRANGE>] statistics [non-zero] [human-readable]
show interface [<IFNAME>|<IFRANGE>] statistics monitor [non-zero] [human-readable]
show interface [<IFNAME>|<IFRANGE>] error-statistics [non-zero] [human-readable]
show interface [<IFNAME>|<IFRANGE>] error-statistics monitor [non-zero] [human-readable]
show interface lag [<LAG-ID>] statistics [non-zero] [human-readable]
show interface lag [<LAG-ID>] statistics monitor [non-zero] [human-readable]
show interface lag [<LAG-ID>] error-statistics [non-zero] [human-readable]
show interface lag [<LAG-ID>] error-statistics monitor [non-zero] [human-readable]
show interface vxlan <VXLAN-ID> statistics [non-zero] [human-readable]
```

Description

Shows statistics for switch interfaces such as packets transmitted and received, bytes transmitted and received, broadcast and multicast packets.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.
LAG	Shows LAG interface information.
<LAG-ID>	Specifies the LAG number. Range: 1-256
VXLAN	Shows the VXLAN interface information.
<VXLAN-ID>	Specifies the VXLAN interface identifier. Default: 1
monitor	Continuously monitor interface statistics.
human-readable	Shows statistics rounded to the nearest power of 1000, for example, 1K, 345M, 2G.
non-zero	Shows only non zero statistics.

Examples

Showing statistics of all interfaces:

```
show interface statistics
-----------------------------------------------------------------------------------------------------------------------------------------------------------
Interface                RX Bytes  RX Packets  RX Drops  TX Bytes  TX Packets  TX Drops  RX Broadcast RX Multicast  TX Broadcast TX Multicast  RX Pause  TX Pa
-----------------------------------------------------------------------------------------------------------------------------------------------------------
1/1/1                     2727136        1975         0     17796         195         0            82         1788            96           54         0
1/1/10                          0           0         0         0           0         0             0            0             0            0         0
1/1/11                          0           0         0         0           0         0             0            0             0            0         0
1/1/12                          0           0         0         0           0         0             0            0             0            0         0
...
1/1/30      - lag1              0           0         0     11271          92         0             0            0             0           51         0
1/1/31      - lag2           2360          25        50   2732119        2040         0             0            0           178         1839         0
1/1/32      - lag2              0           0         0     11373          93         0             0            0             0           51         0
vlan1                           0           0         0         0           0         0             0            0             0            0         0
```

Showing statistics of all interfaces with only non-zero statistics:

```
show interface statistics non-zero
------------------------------------------------------------------------------------------------------------------------------------------------------------
Interface                       RX Bytes   RX Packets  RX Drops  TX Bytes  TX Packets  TX Drops  RX Broadcast  RX Multicast  TX Broadcast  TX Multicast  RX Pause  TX Pause
------------------------------------------------------------------------------------------------------------------------------------------------------------
1/1/1                            2727136         1975         0     17796         195         0            82          1788            96            54         0         0
1/1/30      - lag1                     0            0         0     11271          92         0             0             0             0            51         0         0
1/1/31      - lag2                  2360           25        50   2732119        2040         0             0             0           178          1839         0         0
1/1/32      - lag2                     0            0         0     11373          93         0             0             0             0            51         0         0
```

Showing statistics of all interfaces in the human-readable format:

```
show interface statistics human-readable
--------------------------------------------------------------------------------------------------------------------------------------
Interface               RX Bytes   RX Pkts  RX Drops  TX Bytes   TX Pkts  TX Drops  RX Bcast  RX Mcast  TX Bcast  TX Mcast  RX Pause  TX Pause
--------------------------------------------------------------------------------------------------------------------------------------
1/1/1                       744M      577K         0      745M      578K         0         0         0        73       287         0         0
1/1/2                       474M      367K         0      475M      369K         0         0         0        73       288         0         0
1/1/3                          0         0         0         0         0         0         0         0         0         0         0         0
```

Showing statistics of a single interfaces:

```
show interface 1/1/2 statistics
------------------------------------------------------------------------------------------------------------------------------------------------------------
Interface                       RX Bytes  RX Packets  RX Drops  TX Bytes  TX Packets  TX Drops  RX Broadcast  RX Multicast  TX Broadcast  TX Multicast  RX Pause  TX Pause
------------------------------------------------------------------------------------------------------------------------------------------------------------
1/1/2                            2725080        1931         0     25877         253         0            21          1788            65            55         0         0
```

Showing statistics of all members of a LAG interface:

```
show interface lag1 statistics
------------------------------------------------------------------------------------------------------------------------------------------------------------
Interface                      RX Bytes  RX Packets  RX Drops  TX Bytes  TX Packets  TX Drops  RX Broadcast  RX Multicast  TX Broadcast  TX Multicast  RX Pause  TX Pause
------------------------------------------------------------------------------------------------------------------------------------------------------------
1/1/3       - lag1                 2424          26         0   2734082        2062         0             0             0           191          1848         0         0
1/1/30      - lag1                    0           0         0     12383         100         0             0             0             0            59         0         0
lag1                               2424          26         0   2746465        2162         0             0             0           191          1907         0         0
```

Showing error statistics of all interfaces:

```
show interface error-statistics
----------------------------------------------------------------------------------------------
Interface                           RX Errors    TX Errors    Giants    Runts    CRC/FCS   Collisions
----------------------------------------------------------------------------------------------
1/1/1                                     190           20    100647        0          0            0
1/1/10                                      0            0       100      290       7165          949
1/1/11                                      0            0         0        0          0            0
1/1/12                                      0            0         0        0          0            0
...
1/1/30 - lag1                            1500          500     45800        0          0            0
1/1/31 - lag2                               0            0        11       27          0            0
1/1/32 - lag2                               0            0         0        0          6           18
```

Showing monitor statistics:

The rows and columns of show interface monitor statistics depends on the length of width of the client terminal. The CLI can be navigated using the arrow keys as well as the PageUp, PageDown, Home, and End keys.

```
show interface statistics monitor
---------------------------------------------------------------
Interface                       RX Bytes          RX Packets >>
---------------------------------------------------------------
1/1/1                      3440525421984        53758209526
1/1/2                      3440526607008        53758228042
1/1/3                      3440527785312        53758246453
1/1/30                     3440559671264        53758744653
1/1/31                     3440560851680        53758763098
1/1/32                     3440562028704        53758781489

                                                 help: ?, quit: q
```

```
Help for Interface Monitor

f    Toggle full statistics
h    Toggle human-readable mode
n    Toggle non-zero mode
r    Toggle rate display

c    Clear interface statistics
        Does not apply to rates

Arrows, PgUp, PgDn, Home, End
        Navigate interface statistics

Delay:2
                                                                     help: ?, qui
```

Showing monitor error statistics in human-readable format:

```
show interface 1/1/1-1/1/3,1/1/30-1/1/32 error-statistics monitor human-readable
-------------------------------------------------------------------------------------------
Interface                 RX Errors   TX Errors   RX Giants    RX Runts     CRC/FCS  Collisions
-------------------------------------------------------------------------------------------
1/1/1                             0           0           0           0           0           0
1/1/2                             0           0           0           0           0           0
1/1/3                             0           0           0           0           0           0
1/1/30                            0           0           0           0           0           0
1/1/31                            0           0           0           0           0           0
1/1/32                            0           0           0           0           0           0


Human-readable                                                                  help: ?, quit: q
```

```
Help for Interface Monitor

h    Toggle human-readable mode
n    Toggle non-zero mode

c    Clear interface statistics
        Does not apply to rates

Arrows, PgUp, PgDn, Home, End
        Navigate interface statistics

Delay:2
                                                                     help: ?, quit: q
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.11	Added `moitor` parameter.
10.10	Added `human-readable` parameter.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface transceiver

```
show interface [<INTERFACE-ID>] transceiver [detail | threshold-violations] [vsx-peer]
```

Description

Displays information about transceivers present in the switch. The information shown varies for different transceiver types and manufacturers. Only basic information is shown for unsupported HPE and third-party transceivers installed in the switch and they are also identified with an asterisk in the output.

Parameter	Description
<INTERFACE-ID>	Specifies the name or range of an interface on the switch. Use the format **member/slot/port** (for example, **1/3/1**).
`detail`	Show detailed information for the interfaces.
`threshold-violations`	Show threshold violations for transceivers.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing summary transceiver information with identification of unsupported transceivers:

```
switch(config)# show interface transceiver
-------------------------------------------------------------------
Port      Type           Product      Serial          Part
Number       Number          Number
-------------------------------------------------------------------
1/1/1     SFP+SR         J9150A       MYxxxxxxxx      1990-3657
1/1/2     SFP+ER*        --           --              --
1/2/1     QSFP+SR4       JH233A       MYxxxxxxxx      2005-1234
1/2/2     QSFP+ER4*      --           --              --
1/3/1     SFP28DAC3      844477-B21   MYxxxxxxxx      77fc-7ce7
* unsupported transceiver
```

Showing detailed transceiver information:

```
switch(conf#) show interface transceiver detailing
```

```
Transceiver in 1/1/1
   Interface Name     : 1/1/1
   Type               : SFP+SR
   Connector Type     : LC
   Wavelength         : 850nm
   Transfer Distance  : 0m (SMF), 30m (OM1), 80m (OM2), 300m (OM3)
   Diagnostic Support : DOM
   Product Number     : J9150A
   Serial Number      : MYxxxxxxx
   Part Number        : 1990-3657

Status
   Temperature : 47.65C
   Voltage     : 3.31V
   Tx Bias     : 8.40mA
   Rx Power    : 0.08mW, -10.96dBm
   Tx Power    : 0.56mW, -2.49dBm

Recent Alarms :
   Rx power low alarm
   Rx power low warning
   Recent Errors :
   Rx loss of signal

Transceiver in 1/1/2
   Interface Name     : 1/1/2
   Type               : unknown
   Connector Type     : ??
   Wavelength         : ??
   Transfer Distance  : ??
   Diagnostic Support : ??
   Product Number     : ??
   Serial Number      : ??
   Part Number        : ??

Transceiver in 1/2/1
   Interface Name     : 1/2/1
   Type               : QSFP+SR4
   Connector Type     : MPO
   Wavelength         : 850nm
   Transfer Distance  : 0m (SMF), 0m (OM1), 0m (OM2), 100m (OM3)
   Diagnostic Support : DOM
   Product Number     : JH233A
   Serial Number      : MYxxxxxxx
   Part Number        : 2005-1234

Status
   Temperature : 44.46C
   Voltage     : 3.30V

----------------------------------------------
          Tx Bias  Rx Power     Tx Power
Channel#  (mA)     (mW/dBm)     (mW/dBm)
----------------------------------------------
1         6.12     0.00, -inf   0.63, -1.95
2         6.04     0.00, -inf   0.63, -2.00
3         6.51     0.00, -inf   0.60, -2.16
4         6.19     0.00, -inf   0.63, -1.94

Recent Alarms :
 Channel 1 :
   Rx power low alarm
```

```
    Rx power low warning
  Channel 2 :
    Rx power low alarm
    Rx power low warning
  Channel 3 :
    Rx power low alarm
    Rx power low warning
  Channel 4 :
    Rx power low alarm
    Rx power low warning

Recent Errors :
 Channel 1 :
   Rx Loss of Signal
 Channel 2 :
   Rx Loss of Signal
 Channel 3 :
   Rx Loss of Signal
 Channel 4 :
   Rx Loss of Signal

Transceiver in 1/2/2
  Interface Name     : 1/2/2
  Type               : unknown
  Connector Type     : ??
  Wavelength         : ??
  Transfer Distance  : ??
  Diagnostic Support : ??
  Product Number     : ??
  Serial Number      : ??
  Part Number        : ??

Transceiver in 1/3/1
  Interface Name     : 1/3/1
  Type               : SFP28DAC3
  Connector Type     : Copper Pigtail
  Transfer Distance  : 0.00km (SMF), 0m (OM1), 0m (OM2), 0m (OM3)
  Diagnostic Support : None
  Product Number     : 844477-B21
  Serial Number      : MYxxxxxxx
  Part Number        : 77fc-7ce7
```

Showing detailed transceiver information with identification of unsupported transceivers:

```
Transceiver in 1/1/2
 Interface Name      : 1/1/2
 Type                : SFP+ER (unsupported)
 Connector Type      : LC
 Wavelength          : 3590nm
 Transfer Distance   : 80m (SMF), 0m (OM1), 0m (OM2), 0m (OM3)
 Diagnostic Support  : DOM
 Vendor Name         : INNOLIGHT
 Vendor Part Number  : TR-PX15Z-NHP
 Vendor Part Revision: 1A
 Vendor Serial number: MYxxxxxxx

Status
 Temperature : 28.88C
 Voltage     : 3.30V
 Tx Bias     : 65.53mA
 Rx Power    : 0.00mW, -inf
 Tx Power    : 1.47mW, 1.67dBm

Recent Alarms:
 Rx Power low alarm
 Rx Power low warning
 Recent Errors:
```

Showing transceiver threshold-violations:

```
switch(config)# show interface transceiver threshold-violations
-----------------------------------------------------
Port      Type        Channel  Type(s) of Recent
                               Threshold Violation(s)
-----------------------------------------------------
1/1/1     SFP+SR                Tx bias high warning
                                50.52 mA > 40.00 mA
1/1/2     SFP+ER*               ??
1/2/1     QSFP+SR4    1         Tx power low alarm
                                -17.00 dBm < -0.50 dBm
                      2         Tx bias low warning
                                3.12 mA < 4.00 mA
1/2/2     QSFP+ER4*             ??
1/3/1     SFP28DAC3             n/a
* unsupported transceiver
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface utilization

```
show interface [<IFNNAME>|<IFRANGE>] utilization [non-zero]
```

Description

Displays physical port throughput and utilization.

Parameter	Description
<IFNAME>	Specifies an interface name.
<IFRANGE>	Specifies the port identifier range.
`utilization`	Displays utilization statistics.
`non-zero`	Displays non-zero statistics

Examples

The following example shows port utilization of all interfaces:

```
switch# show interface utilization
-------------------------|------------------------|------------------------|----------------
-----------|----------------------
Interval |              RX          |              TX          |    Total (RX+TX)          |
Interface        seconds |   Mbps  KPkt/s  Util % |   Mbps  KPkt/s  Util % |    Mbps
KPkt/s   Util % | Description
-------------------------|------------------------|------------------------|----------------
-----------|----------------------
1/1/1                300  9578.02  788.70   95.78    25.70   45.89    0.26   9603.72
834.59    96.04   Aruba-AP
1/1/2                300    25.71   45.90    0.26  9581.09  788.96   95.81   9606.80
834.86    96.07   Aruba2530-AP-conce...
1/1/3  - lag123      300     0.00    0.00    0.00     0.00    0.00    0.00      0.00
0.00     0.00   ISL: SWRTS-0064-1
1/1/4                300  9261.79  804.52   92.62  9496.70  823.97   94.97  18758.50
1628.48   187.58   Backup data center...
1/1/5                300  9496.70  823.97   94.97  9261.79  804.52   92.62  18758.50
1628.48   187.58   --
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip interface

`show ip interface <INTERFACE-ID> [vsx-peer]`

Description

Shows status and configuration information for an IPv4 interface.

Parameter	Description
<INTERFACE-ID>	Specifies the name of an interface. Format: **member/slot/port**.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

```
switch# show ip interface 1/1/1
Interface 1/1/1 is up
 Admin state is up
 Hardware: Ethernet, MAC Address: 70:72:cf:fd:e7:b4
 IPv4 address 192.168.1.1/24
 MTU 1500
 RX
      0 packets, 0 bytes
 TX
      0 packets, 0 bytes
```

```
switch# show interface <intfid>.id
Interface 1/1/14.1 is up
Admin state is up
IP MTU 1500
Description:
Hardware: Ethernet, MAC Address: b8:6a:97:22:2f:42
Encapsulation dot1q ID: 20
IPv4 address 30.0.0.1/24
L3 Counters: Rx Disabled, Tx Disable
```

```
switch# show interface lag2.1
Interface lag2.1 is up
Admin state is up
IP MTU 1500
Description:
Hardware: Ethernet, MAC Address: b8:6a:97:22:2f:42
Encapsulation dot1q ID: 30
L3 Counters: Rx Disabled, Tx Disabled
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip source-interface

```
show ip source-interface {sflow |  tftp |  radius | tacacs | all} [vrf <VRF-NAME>]
     [vsx-peer]
```

Description

Shows single source IP address configuration settings.

Parameter	Description
`sflow | tftp | radius | tacacs | all`	Shows single source IP address configuration settings for a specific protocol. The **all** option shows the global setting that applies to all protocols that do not have an address set.
`vrf <VRF-NAME>`	Specifies the name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
Showing single source IP address configuration settings for sFlow:
switch# show ip source-interface sflow
Source-interface Configuration Information
----------------------------------------
Protocol        Source Interface
--------        ----------------
sflow            10.10.10.1
```

Showing single source IP address configuration settings for all protocols:

```
switch# show ip source-interface all
Source-interface Configuration Information
----------------------------------------
Protocol        Source Interface
--------        ----------------
all             1/1/1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show ipv6 interface

```
show ipv6 interface <INTERFACE-ID> [vsx-peer]
```

Description

Shows status and configuration information for an IPv6 interface.

Parameter	Description
<INTERFACE-ID>	Specifies an interface ID. Format: **member/slot/port**.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch#
switch# show ipv6 interface 1/1/1
Interface 1/1/1 is up
  Admin state is up
  IPv6 address:
    2001:0db8:85a3:0000:0000:8a2e:0370:7334/24 [VALID]
  IPv6 link-local address: fe80::1e98:ecff:fee3:e800/64 (default)[VALID]
  IPv6 virtual address configured: none
  IPv6 multicast routing: disable
  IPv6 Forwarding feature: enabled
  IPv6 multicast groups locally joined:
    ff02::ff70:7334  ff02::ffe3:e800  ff02::1  ff02::1:ff00:0
    ff02::2
  IPv6 multicast (S,G) entries joined: none
  IPv6 MTU: 1524 (using link MTU)
  IPv6 unicast reverse path forwarding: none
  IPv6 load sharing: none
  RX
          0 packets, 0 bytes
  TX
          0 packets, 0 bytes
```

```
switch# show ipv6 interface <intfid>.id
Interface 1/1/14.1 is up
  Admin state is up
    IPv6 address:
      30::1/64 [VALID]
    IPv6 link-local address: fe80::b86a:97c0:122:2f42/64 [VALID]
    IPv6 virtual address configured: none
    IPv6 multicast routing: disable
    IPv6 Forwarding feature: enabled
    IPv6 multicast groups locally joined:
      ff02::1  ff02::1:ff22:2f42  ff02::1:ff00:1  ff02::1:ff00:0
      ff02::2
    IPv6 multicast (S,G) entries joined: none
    IPv6 MTU 1500
    IPv6 unicast reverse path forwarding: none
    IPv6 load sharing: none
Encapsulation dot1q ID: 20
```

```
switch# show ipv6 interface lag2.1
Interface lag2.1 is up
  Admin state is up
    IPv6 address:
      40::1/64 [VALID]
    IPv6 link-local address: fe80::b86a:97c0:122:2f42/64 [VALID]
    IPv6 virtual address configured: none
    IPv6 multicast routing: disable
    IPv6 Forwarding feature: enabled
    IPv6 multicast groups locally joined:
      ff02::1  ff02::1:ff22:2f42  ff02::1:ff00:1  ff02::1:ff00:0
      ff02::2
    IPv6 multicast (S,G) entries joined: none
    IPv6 MTU 1500
    IPv6 unicast reverse path forwarding: none
    IPv6 load sharing: none
  Encapsulation dot1q ID: 30
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 source-interface

```
show ipv6 source-interface {sflow |  tftp |  radius | tacacs | all} [vrf <VRF-NAME>]
     [vsx-peer]
```

Description

Shows single source IP address configuration settings.

Parameter	Description
`sflow	tftp	radius	tacacs	all`	Shows single source IP address configuration settings for a specific protocol. The **all** option shows the global setting that applies to all protocols that do not have an address set.
`vrf <VRF-NAME>`	Specifies the name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing single source IP address configuration settings for sFlow:

```
switch# show ipv6 source-interface sflow

Source-interface Configuration Information
----------------------------------------
Protocol        Source Interface
--------        ----------------
 sflow            2001:DB8::1
```

Showing single source IP address configuration settings for all protocols:

```
switch# show ipv6 source-interface all

Source-interface Configuration Information
----------------------------------------
Protocol        Source Interface
--------        ----------------
 all             1/1/1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

shutdown

```
shutdown
no shutdown
```

Description

Disables an interface. Interfaces are disabled by default when created.

The **no** form of this command enables an interface.

Examples

Disabling an interface:

```
switch(config-if)# shutdown
```

Enabling an interface:

```
switch(config-if)# no shutdown
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

speed

```
speed {<SPEED> | <SPEED-DUPLEX> | auto [<SPEED>] }
no speed
```

Description

Configures the link speed, duplex, and auto-negotiation settings for an interface.

The no form of this command removes the configurations and returns to the defaults.

Parameter	Description
`Speed`	Configures interface speed, duplex, and auto-negotiation.
`10-full`	10 Mbps, full duplex, no auto-negotiation
`10-half`	10 Mbps, half duplex, no auto-negotiation
`100-full`	100 Mbps, full duplex, no auto-negotiation
`100-half`	100 Mbps, half duplex, no auto-negotiation
`1000-full`	1000 Mbps, full duplex, no auto-negotiation
`10g`	10 Gbps, full duplex, no auto-negotiation
`25g`	25 Gbps, full duplex, no auto-negotiation
`40g`	40 Gbps, full duplex, no auto-negotiation
`50g`	50 Gbps, full duplex, no auto-negotiation
`100g`	100 Gbps, full duplex, no auto-negotiation
`200g`	200 Gbps, full duplex, no auto-negotiation **NOTE:** Not applicable for override.
`400g`	400 Gbps, full duplex, no auto-negotiation **NOTE:** Not applicable for override.
`auto`	Auto-negotiate speed and duplex. More than one speed can be set at a time.
`10m`	Allow interface to link at 10 Mbps.
`100m`	Allow interface to link at 100 Mbps.
`1g`	Allow interface to link at 1 Gbps.
`2.5g`	Allow interface to link at 2.5 Gbps.
`5g`	Allow interface to link at 5 Gbps.
`10g`	Allow interface to link at 10 Gbps.

Parameter	Description
`25g`	Allow interface to link at 25 Gbps.
`40g`	Allow interface to link at 40 Gbps.
`50g`	Allow interface to link at 50 Gbps.
`100g`	Allow interface to link at 100 Gbps.
`200g`	Allow interface to link at 200 Gbps.
`400g`	Allow interface to link at 400 Gbps.

Usage

The following options can be configured for an interface. The option available is based on the interface type.

`speed` *`<SPEED-DUPLEX>`*

Uses a fixed speed and duplex mode with no auto-negotiation. Half-duplex is only supported for 10 Mbps and 100 Mbps link speeds.

`speed` *`<SPEED>`*

Uses a fixed speed with no auto-negotiation. If the currently installed transceiver does not support the speed, the setting is ignored and the port will use the highest speed that is supported.

`speed auto`

Uses auto-negotiation and offers all speeds supported by the port and transceiver. This is the default. If the link technology does not support auto-negotiation this setting is ignored, and the port uses the highest possible fixed speed.

`speed auto` *`<SPEED>`*

Uses auto-negotiation and offers the specified speeds only. For ports that support pluggable transceivers, only speeds supported by the transceiver are offered and other speeds are ignored. If the link technology does not support auto-negotiation, this setting is ignored and the port uses the highest possible fixed speed.

Examples

Configuring an interface to operate at a fixed speed of 1000 Mbps with full duplex and no auto-negotiation:

```
switch(config)# interface 1/1/1

switch(config-if)# speed 1000-full
```

Configuring an interface to operate at a fixed speed of 10 Gbps with no auto-negotiation:

```
switch(config)# interface 1/1

switch(config-if)# speed 10g
```

Configuring an interface to auto-negotiate and advertise only 1 Gbps and 2.5 Gbps speeds:

```
switch(config)# interface 1/1/1
switch(config-if)# speed auto 1g 2.5g
```

Configuring an interface to override the detected transceiver speed and use the configured speed if the installed transceiver does not support auto-negotiation:

```
switch(config)# interface 1/1/1
switch(config-if)#speed auto 50g override
```

Configuring an interface to use default settings for speed, duplex, and auto-negotiation:

```
switch(config)# interface 1/1/1
switch(config-if)#no speed
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.09.0001	Speeds not supported by hardware hidden by CLI.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

system interface-group

This command only applies to the following 6400 Switch Series modules:

R0X44A Aruba 6400 48p 10G/25G SFP28 Module

R0X44C Aruba 6400 48p 1G/10G/25G SFP28 v2 Module

```
system interface-group <GROUP> line-module <SLOT-ID> speed <SPEED>
no system interface-group <GROUP> line-module <SLOT-ID> speed <SPEED>
system interface group member <MEMBER-ID>
no system interface group member <MEMBER-ID>
```

Description

Configures the speed for an interface group. After changing group speed, only transceivers compatible with the new speed will be enabled.

- (Applies to the 6400 Switch Series): R0X44C (version 2) is the only module that can apply 50G speed as an option. If the command is attempted to any other type of module, the command is ignored.
- All speed-mismatched interfaces in the group will be disabled.
- This command can interrupt active network links, user confirmation is required to proceed.

The **no** form of this command resets the specified interface group to its default.

Parameter	Description
<GROUP>	Specifies the interface group to configure.
<SPEED>	Configures transceiver speed (10g, 25g or 50g) for a group. Default is 25g (see the *Transceiver Guide* for further detail). On 6400 Switch Series: 25g allows transceivers up to 25Gbps. 50g allows 50Gbps transceivers and DACs on the R0X44C version 2 module. This command is ignored on any other type of module (including R0X44A version 1).
<SLOT-ID>	Specifies the slot ID of the line module.
member *<MEMBER-ID>*	Specifies the VSF member ID of the VSF member of the group. (*For 6300 Switch Series only.*)

Examples

Configuring interface group 1 on line-module 1/1 to allow 10Gbps and slower transceivers:

```
switch(config)# system interface-group 1 line-module 1/1 speed 10g
Changing the group speed will disable all member interfaces that do not match the
new speed.

Continue (y/n)? y
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced on 6300 Switch series.
10.09.0002	Command introduced on 6400 and 8400 Switch series.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

client track ip

`client track ip`

Description

Enables client IP address tracking on the switch. The default is disabled on global and VLAN levels.

Admin users can enable client IP address tracking at the VLAN level.

Tracking enabling will take effect only if the client IP address tracking is enabled at system and VLAN level.

The **no** form of the command disables client IP address tracking. If tracking is disabled at switch level, it will be stopped even if it is enabled at VLAN or port level.

Example

Enable client IP address tracking at switch level:

```
switch(config)# client track ip
```

Enable client IP address tracking on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# client track ip
```

Enable client IP address tracking on VLANs 10 to 100:

```
switch(config)# vlan 10-100
switch(config-vlan-<10-100>)# client track ip
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300	`config`	Operators or Administrators or local user group members with

Platforms	Command context	Authority
6400		execution rights for this command. Operators can execute this command from the operator context (>) only.

client track ip { enable | disable | auto }

```
client track ip { enable | disable | auto }
```

Description

Enables client IP address tracking on the specified set of interfaces. Tracking will take effect only if client IP address tracking is enabled at both the system level and for the VLAN to which the port belongs. Default: auto.

The **no** form of the command disables client IP address tracking on the specified set of interfaces.

Parameter	Description
`enable`	Specifies that all client IP addresses will be tracked in the port.
`disable`	Specifies that client IP addresses will not be tracked in the port.
`auto`	Specifies the following: For LLDP devices: Only the specified client IP address will be tracked in the port and other client IP addresses will not be tracked. For non-LLDP devices: All client IP addresses will be tracked in the port.

Example

Enable client IP address tracking on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# client track ip enable
```

Enable client IP address tracking on interfaces 1/1/1 to 1/1/5:

```
switch(config)# interface 1/1/1-1/1/5
switch(config-if-<1/1/1-1/1/5>)# client track ip enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

client track ip client-limit

`client track ip client-limit <CLIENT-LIMIT>`

Description

Configures the maximum number of clients to be tracked on the specified set of interfaces.

The **no** form of the command resets the client limit to the default value. Default values vary according to switch model:

- 6300: 2048
- 6400: 4096

Parameter	Description
CLIENT-LIMIT	Specifies the maximum number of clients tracked on a port. Required. Range: 1-2048 (6300) 1-4096 (6400). Default: 2048 (6300) 4096 (6400)..

Example

Configure the maximum number of clients to be tracked on interface 1/1/5:

```
switch(config)# interface 1/1/5
switch(config-if)# client track ip client-limit 32
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

client track ip update-interval

```
client track ip update-interval <INTERVAL>
```

Description

Configures how often client IP addresses are updated.

The **no** form of the command resets the update interval to the default of 1800 seconds.

Parameter	Description
INTERVAL	Specifies the update interval in seconds. Required. Range: 60-28000. Default: 1800.

Example

Configure the update interval for an interface:

```
switch(config)# interface 1/1/1
switch(config-if)# client track ip update-interval 600
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

client track ip update-method probe

```
client track ip update-method probe
```

Description

Enables probing the client to update the IP address.

The probe is sent to all clients on the tracking list that have an IP address in the following scenarios:

1. IP packets are not received from the clients during the IP address update cycle.
2. There is no IP packet from a learned IP address. In this case, a probe will be sent for the IP address to confirm if it is still owned by that client.

The **no** form of the command disables probing.

Example

Disable probing to update the client IP address:

```
switch(config)# no client track ip update-method probe
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities

```
show capacities
```

Description

Shows the capacities configured on the switch.

Example

```
switch# show capacities

System Capacities:
Capacities Name                                                              Value
----------------------------------------------------------------------------------
Maximum number of Access Control Entries configurable in a system            14336
Maximum number of Access Control Lists configurable in a system               1024
Maximum number of class entries configurable in a system                      1024
Maximum number of classes configurable in a system                             512
Maximum number of entries in an Access Control List                           1024
Maximum number of entries in a class                                          1024
Maximum number of entries in a policy                                         1024
Maximum number of classifier policies configurable in a system                 512
Maximum number of policy entries configurable in a system                     1024
Maximum number of clients supported for tracking the IP address in the system  128

switch# show capacities client-track-ip-client-limit

System Capacities: Filter Client Track IP Client Limit
Capacities Name
Value
----------------------------------------------------------------------------------
-
Maximum number of clients supported for tracking the IP address in the system
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>)	Administrators or local user group members with execution rights for this command.

show client ip { count | port | vlan }

```
show client ip { count | port | vlan }
```

Description

Shows number of client IP addresses or information about client IP addresses tracked on ports and VLANs.

Parameter	Description
count	Displays number of clients tracked.
port	Displays client IP addresses tracked on the ports.
vlan	Displays client IP addresses tracked on the VLANs.

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>)	Administrators or local user group members with execution rights for this command.

Chapter 52
IP Directed Broadcast commands

copy support-file feature

```
copy support-file feature l3
```

Description

Captures support logs to debug any IP Directed Broadcast issues.

IP Directed Broadcast is not supported on subinterfaces on 8100, 6300, 6400, 8325, 8360 and 10000 Switch series.

Examples

Capturing the support logs into a local file:

```
switch# copy support-file feature l3 sftp
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

ip directed-broadcast

```
ip directed-broadcast
no ip directed-broadcast
```

Description

Turns on IP Directed Broadcast for the specified interface. The **no** form of this command turns it off.

This command is disabled by default.

IP Directed Broadcast is not supported on subinterfaces on 6300, 6400, 8100, 8325, 8360 and 10000 Switch series.

Examples

Enabling and disabling IP Directed Broadcast on an physical interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip directed-broadcast
switch(config-if)# no ip directed-broadcast
```

Enabling and disabling IP Directed Broadcast on a VLAN interface:

```
switch(config)# interface vlan 100
switch(config-if-vlan)# ip directed-broadcast
switch(config-if-vlan)# no ip directed-broadcast
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show arp

`show arp`

Description

Shows IP directed broadcast verification.

IP Directed Broadcast is not supported on subinterfaces on 8100, 6300, 6400, 8325, 8360 and 10000 Switch series.

Examples

Showing IP directed broadcast verification:

```
switch# show arp
IPv4 Address     MAC                Port         Physical Port          State
----------------------------------------------------------------------------------
1.1.1.255        FF:FF:FF:FF:FF:FF  1/1/1        1/1/1                  permanent
3.1.1.255        FF:FF:FF:FF:FF:FF  vlan10                              permanent
```

```
Total Number Of ARP Entries Listed: 2.
----------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip interface

`show ip interface <INTERFACE-NAME>`

Description

Displays the status of IP Directed Broadcast on the specified interface along with other interface related attributes.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to use as a source for displaying the status of the IP Directed Broadcast.

Examples

Displaying the IP Directed Broadcast status on the specified interface:

```
switch# show ip interface vlan30


Interface vlan30 is up
 Admin state is up
 Hardware: Ethernet, MAC Address: 94:f1:28:21:63:00
 IP MTU 1500
 IP Directed Broadcast is Enabled
 IPv4 address 192.168.3.1/24
 L3 Counters: Rx Disabled, Tx Disabled

 Statistics                      RX                   TX               Total
 ------------- -------------------- -------------------- --------------------
```

```
L3 Packets                        0                    0                    0
L3 Bytes                          0                    0                    0
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip directed-broadcast

```
show ip directed-broadcast
```

Description

Displays the summary of the interfaces on which IP Directed Broadcast is enabled.

Examples

On the 6400 Switch Series, interface identification differs.

Displaying the summary of the interfaces on which IP Directed Broadcast is enabled:

```
switch# show ip directed-broadcast

 IPv4 Directed Broadcast Configuration

 Interface       Status
 ----------     --------
 1/1/1           Enabled
 vlan10          Enabled
 vlan30          Enabled
```

Displaying IP Directed Broadcast Host entries installed in Neighbor cache:

```
switch# show arp state permanent
IPv4 Address     MAC                Port         Physical Port    State
---------------------------------------------------------------------------
52.1.1.255       FF:FF:FF:FF:FF:FF  1/1/1        1/1/1            permanent
40.0.0.255       FF:FF:FF:FF:FF:FF  vlan20       vlan20           permanent
Total Number Of ARP Entries Listed- 2.
-------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 53

IP Neighbor Flood commands

ip neighbor-flood

```
ip neighbor-flood
```

Description

Enables VLAN flooding for the specified VLAN interface when a neighbor link goes down.

The **no** form of this command disables VLAN flooding for the specified VLAN interface.

Examples

Enabling IP Neighbor Flood on a VLAN interface:

```
switch(config)# interface vlan 3
switch(config-if-vlan)# ip neighbor-flood
```

Disabling IP Neighbor Flood on a VLAN interface.

```
switch(config)# interface vlan 3
switch(config-if-vlan)# no ip neighbor-flood
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

show ip interface

```
show ip interface <IFNAME>
```

Description

Displays the status of IP Neighbor Flood on the specified interface along with other interface-related attributes.

Parameter	Description
<IFNAME>	Specifies the interface name (for example, `vlan30`). Optional.

Examples

```
switch# show ip interface vlan30

Interface vlan30 is up
 Admin state is up
 Hardware: Ethernet, MAC Address: 94:f1:28:21:63:00
 IP MTU 1500
 IP Neighbor Flood is Enabled
 IPv4 address 192.168.3.1/24
 L3 Counters: Rx Disabled, Tx Disabled
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip neighbor-flood

```
show ip neighbor-flood
```

Description

Displays the interfaces on which IP Neighbor Flood is enabled.

Examples

```
switch# show ip neighbor-flood

 IP Neighbor Flood Configuration

 Interface        Status
 ---------        -------
```

```
vlan10          Enabled
vlan30          Enabled
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config

`show running-config`

Description

Displays the current running configuration.

Examples

```
switch# show running-config
interface vlan10
    ip neighbor-flood
interface vlan30
    ip neighbor-flood
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 54

IP Prefix priority commands

ip prefix-priority

```
ip prefix-priority <PREFIX-LENGTHS>
no ip prefix-priority [<PREFIX-LENGTHS>>]
```

Description

Configures custom IPv4 route prefix lengths for the exact prefix match tables of the switch. The switch must be rebooted to apply the change.

Following the reboot, IPv4 prefix priorities will remain in a pending state until at least one route is learned. A connected route counts so this can be as simple as having an L3 interface with an IP address in the up state.

The no form of this command resets the prefix lengths to their default

Parameter	Description
<PREFIX-LENGTHS>>	Specifies a space-separated list of exactly five or six prefix lengths, in descending order. Range: 8 to 31. On the 6300 Switch Series, six prefix lengths are used. On the 6400 Switch Series, six prefix lengths are used for profiles **default** and **V2-default**, and five prefix lengths are used for profile **v2-Core-High-Bandwidth**.

Examples

Configuring custom IPv4 route prefix lengths:

```
switch(config)# ip prefix-priority 29 28 27 24 23 16
Save this config and reboot the switch for the changes to take effect
...
```

Resetting IPv4 route prefix lengths to their default:

```
switch(config)# no ip prefix-priority
Save this config and reboot the switch for the changes to take effect
...
```

Attempting to configure custom IPv4 route prefix lengths with some lengths not in descending order:

```
switch(config)# ip prefix-priority 28 29 27 23 24 16
Prefix lengths must be specified in descending order
```

Attempting to configure eight prefix lengths:

```
switch(config)# ip prefix-priority 29 28 27 24 23 16 12 8
Invalid input: 12
```

Attempting to configure three prefix lengths:

```
switch(config)# ip prefix-priority 29 28 27
% Command incomplete.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ipv6 prefix-priority

```
ipv6 prefix-priority <PREFIX-LENGTHS>
no ipv6 prefix-priority [<PREFIX-LENGTHS>>]
```

Description

Configures custom IPv6 route prefix lengths for the exact prefix match tables of the switch. The switch must be rebooted to apply the change.

Following the reboot, IPv6 prefix priorities will remain in a pending state until at least one route is learned. A connected route counts so this can be as simple as having an L3 interface with an IP address in the up state.

The no form of this command resets the prefix lengths to their default

Parameter	Description
<PREFIX-LENGTHS>>	Specifies a space-separated list of exactly five or six prefix lengths, in descending order. Range: 8 to 64. On the 6300 Switch Series, six prefix lengths are used. On the 6400 Switch Series, six prefix lengths are used for profiles **default** and **V2-default**, and five prefix lengths are used for profile **v2-Core-High-Bandwidth**.

Examples

Configuring custom IPv6 route prefix lengths:

```
switch(config)# ipv6 prefix-priority 64 63 62 32 31 28
Save this config and reboot the switch for the changes to take effect
...
```

Resetting IPv6 route prefix lengths to their default:

```
switch(config)# no ipv6 prefix-priority
Save this config and reboot the switch for the changes to take effect
...
```

Attempting to configure custom IPv6 route prefix lengths with some lengths not in descending order:

```
switch(config)# ipv6 prefix-priority 64 62 63 31 32 28
Prefix lengths must be specified in descending order
```

Attempting to configure eight prefix lengths:

```
switch(config)# ipv6 prefix-priority 64 63 62 32 31 28 24 23
Invalid input: 24
```

Attempting to configure three prefix lengths:

```
switch(config)# ipv6 prefix-priority 64 63 31
% Command incomplete.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ip prefix-priority

```
show ip prefix-priority
```

Description

Shows the configuration, status, and defaults of the IPv4 route prefix lengths for the exact prefix match tables of the switch.

Examples

Showing configured IPv4 route prefix lengths that are pending until the switch is rebooted and at least one route is learned:

```
switch# show ip prefix-priority

 IP Exact-Prefix Table Information

 Configuration Status: Ready to apply on next reboot

          Default   Current   Pending
  Table    Length    Length    Length
  -----------------------------------
  1            24        24        29*
  2            23        23        28*
  3            22        22        27*
  4            21        21        24*
  5            16        16        23*
  6             8         8        16*

  * Pending values will be applied on the next reboot
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 prefix-priority

`show ipv6 prefix-priority`

Description

Shows the configuration, status, and defaults of the IPv6 route prefix lengths for the exact prefix match tables of the switch.

Examples

Showing configured IPv6 route prefix lengths that are pending until the switch is rebooted and at least one route is learned:

```
switch# show ipv6 prefix-priority

 IPv6 Exact-Prefix Table Information

 Configuration Status: Ready to apply on next reboot

          Default   Current   Pending
  Table    Length    Length    Length
  -----------------------------------
  1            64        64        64
  2            48        48        63*
  3            46        46        62*
  4            44        44        32*
  5            40        40        31*
  6            36        36        28*

  * Pending values will be applied on the next reboot
```

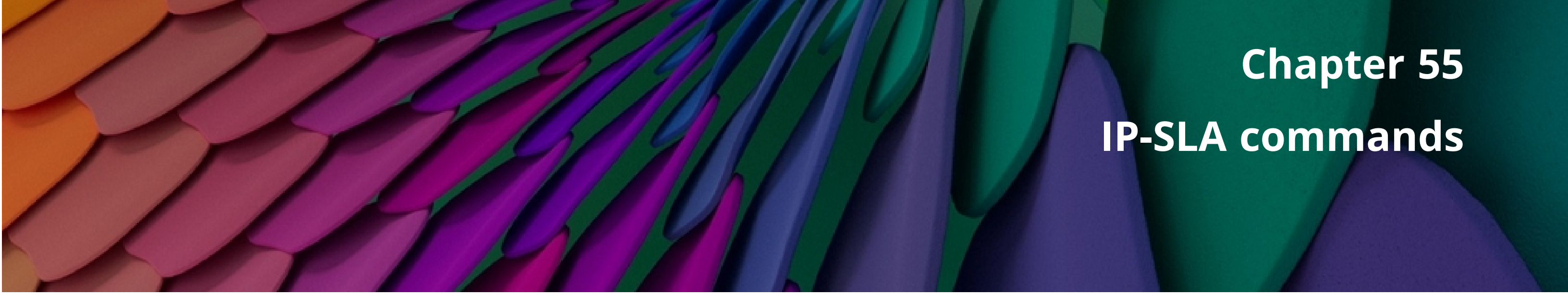
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 55

IP-SLA commands

http

```
http {get | raw} URL [source {<SOURCE-IPV4-ADDR> | <IFNAME>} source-port <PORT-NUM>]
     [proxy proxy-url] [cache disable] [name-server <IPV4-ADDR-DNS-SERVER>]
     [probe-interval <30-604800>] [version<VERSION-NUMBER>] [http-raw-request <RAW-
PAYLOAD>]
```

Description

Configures HTTP as the IP-SLA test mechanism. Requires destination URL and type of HTTP request (raw/get).

Parameter	Description
`{get	raw}`	Selects HTTP request type as get or raw where the system will generate or provide HTTP payload.
`URL`	Specifies HTTP URL address of syntax. http://<HOST NAME/IP-ADDRESS>:<PORT>/<PATH>.
`source {<SOURCE-IPV4-ADDR>	<IFNAME>}`	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
`source-port <PORT-NUM>`	Specifies the value of the source port for the IP-SLA probes.
`cache disable`	Selects cache option for the HTTP server. By default the option is enabled.
`name-server <IPV4-ADDR-DNS-SERVER>`	Specifies the IPv4 address of DNS server.
`probe-interval <PROBE-INTERVAL>`	Specifies the probe interval in seconds. Range: 30 to 604800.
`version <VERSION-NUMBER>`	Specifies the source interface to use for sending IP-SLA probes.
`http-raw-request <RAW-PAYLOAD>`	HTTP raw request. String.

Examples

```
switch(config-ipsla-1)# http get http://device.arubanetworks.com/root/home.html
switch(config-ipsla-1)# http raw http://device.arubanetworks.com/root/home.html
switch(config-ipsla-1)# http 2.2.2.2 source 1/1/1
switch(config-ipsla-1)# http http://device.arubanetworks.com  source 2.2.2.1
switch(config-ipsla-1)# http http://device.arubanetworks.com/root/home.html
source-interface 1/1/1
switch(config-ipsla-1)# http http://device.arubanetworks.com  name-server
```

```
10.10.10.2
switch(config-ipsla-1)# http raw raw-request "GET /en/US/hmpgs/index.html
HTTP/1.0\r\n\r\n"
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

https

```
https {get | raw} URL [source {<SOURCE-IPV4-ADDR> | <IFNAME>} source-port <PORT-NUM>]
     [proxy proxy-url] [cache disable] [name-server <IPV4-ADDR-DNS-SERVER>]
     [probe-interval <<PROBE-INTERVAL>>] [version <VERSION-NUMBER>] [https-raw-request
<RAW-PAYLOAD>]
no https {get | raw} URL [source {<SOURCE-IPV4-ADDR> | <IFNAME>} source-port <PORT-NUM>]
     [proxy proxy-url] [cache disable] [name-server <IPV4-ADDR-DNS-SERVER>]
     [probe-interval <<PROBE-INTERVAL>>] [version <VERSION-NUMBER>] [https-raw-request
<RAW-PAYLOAD>]
```

Description

Configures HTTPS as the IP-SLA test mechanism. Requires destination URL and type of HTTPS request (get/raw).

The **no** form of this command removes the configuration.

For HTTPS IP-SLA sessions, it is not required to install a certificate on the switch.

Parameter	Description
`{get | raw}`	Selects HTTPS request type as get or raw where the system will generate or provide HTTPS payload.
`URL`	Specifies HTTPS URL address of syntax. https://<HOST NAME/IP-ADDRESS>:<PORT>/<PATH>.
`source {<SOURCE-IPV4-ADDR> | <IFNAME>}`	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
`source-port <PORT-NUM>`	Specifies the value of the source port for the IP-SLA probes.

Parameter	Description
cache disable	Selects cache option for the HTTPS server. By default the option is enabled.
name-server *<IPV4-ADDR-DNS-SERVER>*	Specifies the IPv4 address of DNS server.
probe-interval *<PROBE-INTERVAL>*	Specifies the probe interval in seconds. Range: 30 to 604800.
version *<VERSION-NUMBER>*	Specifies the source interface to use for sending IP-SLA probes.
https-raw-request *<RAW-PAYLOAD>*	HTTPS raw request. String.

Examples

```
switch(config-ipsla-1)# https get https://device.arubanetworks.com/root/home.html
switch(config-ipsla-1)# https get https://2.2.2.2 source 1/1/1
switch(config-ipsla-1)# https get https://device.arubanetworks.com  source 2.2.2.1
switch(config-ipsla-1)# https get https://device.arubanetworks.com/root/home.html
source-interface 1/1/1
switch(config-ipsla-1)# https get https://device.arubanetworks.com  name-server
10.10.10.2
switch(config-ipsla-1)# https raw https://device.arubanetworks.com/root/home.html
raw-request “GET /en/US/hmpgs/index.html”
switch(config-ipsla-1)# no https get https://2.2.2.2 source 1/1/1
switch(config-ipsla-1)# no https raw
https://device.arubanetworks.com/root/home.html raw-request “GET
/en/US/hmpgs/index.html”
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.12.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	config-ip-sla-*<IP-SLA-NAME>*	Administrators or local user group members with execution rights for this command.

icmp-echo

```
icmp-echo {<DEST-IPV4-ADDR>|<HOSTNAME>} [source {<SOURCE-IPV4-ADDR> | <IFNAME>}]
     [name-server <IPV4-ADDR-DNS-SERVER>] [payload-size <PAYLOAD-SIZE>]
     [tos <TYPE-OF-SERVICE>] [probe-interval <PROBE-INTERVAL>]
```

Description

Configures ICMP echo as the IP-SLA test mechanism. Requires destination address for the IP-SLA test.

Parameter	Description
`{<DEST-IPV4-ADDR> | <HOSTNAME>}`	Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.
`[source {<SOURCE-IPV4-ADDR> | <IFNAME>}]`	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
`name-server <IPV4-ADDR-DNS-SERVER>`	Specifies the DNS server for destination hostname resolution.
`payload-size <PAYLOAD-SIZE>`	Specifies the payload size of an SLA probe. Range: 0 to 1440.
`tos <TYPE-OF-SERVICE>`	Specifies the type of serve to be used in the probe packets. Range: 0 to 255.
`probe-interval <PROBE-INTERVAL>`	Specifies the probe interval in seconds. Range: 5 to 604800.

Examples

```
switch(config)# ip-sla test
switch(config-ip-sla-test)# icmp-echo 2.2.2.2
switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3
    switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3 payload-size 400
    switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3 payload-size 400
name-server 4.4.4.4
    switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3 payload-size 400
name-server 4.4.4.4  probe-interval 80
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

ip-sla

```
ip-sla <IP-SLA-NAME>
no ip-sla <IP-SLA-NAME>
```

Description

Creates an IP Service Level Agreement (SLA) profile and switches to the **config-ip-sla** context.

The **no** form of this command deletes an IP-SLA profile. By default, all profile use the default VRF (default).

Parameter	Description
<IP-SLA-NAME>	Specifies an IP-SLA profile name. Length: 1 to 64 characters.

Examples

Creating an IP-SLA:

```
switch(config)# ip-sla 1
switch(config-ip-sla-1)#
```

Deleting an IP-SLA:

```
switch(config)# no ip-sla 1
switch(config)#
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

ip-sla responder

```
ip-sla responder <SLA-NAME> {udp-echo | tcp-connect | udp-jitter-voip} <PORT-NUM>
     [source {<SOURCE-IPV4-ADDR> | <IFNAME>}][vrf <VRF-NAME>]
no ip-sla responder <SLA-NAME> {udp-echo | tcp-connect | udp-jitter-voip} <PORT-NUM>
     [source {<SOURCE-IPV4-ADDR> | <IFNAME>}][vrf <VRF-NAME>]
```

Description

Selects the IP-SLA responder. The responder can be configured for udp-echo, tcp-connect, udp-jitter-voip type. It requires the SLA name, SLA type, and port number as arguments. Source IP/interface ID is a must for type udp-jitter-voip and optional for other types.

The **no** form of this command removes the IP-SLA responder.

Parameter	Description
<SLA-NAME>	Specifies the SLA name. Length: 1 to 64 characters.
udp-echo	Enables responder for udp-echo probes.
tcp-connect	Selects TCP connect as the IP-SLA test mechanism.
vrf *<VRF-NAME>*	Specifies the name of the VRF to use.
udp-jitter-voip	Selects VOIP jitter as the IP-SLA test mechanism.
<PORT-NUM>	Specifies the port number to listen for IP-SLA probes. Range: 1 to 65535.
[source {*<SOURCE-IPV4-ADDR>* | *<IFNAME>*}]	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.

Examples

```
switch(config)# ip-sla responder SLA1 udp-echo 8000 source 2.2.2.2
switch(config)# ip-sla responder SLA1 udp-echo 8000 source 1/1/1
```

```
switch(config)# no ip-sla responder SLA1 udp-echo 8000 source 2.2.2.2
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

show ip-sla responder

```
show ip-sla responder <SLA-NAME>
```

Description

Shows the given IP-SLA responder configuration and operation status.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.

Examples

```
switch(config)# show ip-sla responder SLA3

    SLA Name            : SLA3
    IP-SLA Type         : Udp-echo
    VRF                 : Default
    Responder Port      : 8000
    Responder IP        : 2.2.2.3
    Responder Interface : 1/1/1
    Responder Status    : Running

switch(config)# show ip-sla responder 1

  SLA Name            : 1 (non-persistent)
  SLA Type            : udp-echo
  VRF Name            : default
  Responder Port      : 10
  Responder IP        :
  Responder Interface :
  Responder Status    : Running
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ip-sla responder results

`show ip-sla responder <SLA-NAME> <SOURCE-IPV4-ADDR> <PORT-NUM> results`

Description

Shows the given ip-sla responder statistics for a given source IP and port. This command is only applicable for the sources where source IP and port are configured.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.
<SOURCE-IPV4-ADDR>	Specifies the source IPV4 address.
<PORT-NUM>	Specifies the port number. Range: 1 to 65535.

Examples

```
switch# show  ip-sla responder SLA1 2.2.2.1 8000 results

    IP-SLA Type          : Udp-echo
    VRF Name             : Default
    Source IP            : 2.2.2.1
    Source Port          : 8000
    Responder Port       : 8888
    Responder IP         : 2.2.2.3
    Responder Interface  :
    Responder Status     : Running
    Packets Received     : 2
    Packets Sent         : 2
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ip-sla

`show ip-sla {<SLA-NAME> [results] | all}`

Description

Shows the given IP-SLA source configuration and status.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.
`results`	Shows the statistics calculated for an SLA type.
`all`	Shows all ip-sla source configurations and status.

Examples

```
switch# show ip-sla xyz results

    IP-SLA session status
```

```
       IP-SLA Name                     : xyz
       IP-SLA Type                     : tcp-connect
       Destination Host Name/IP Address: 2.2.2.1
       Destination Port                : 8888
       Source IP Address/IFName        : 2.2.2.2
       Source Port                     : 5555
       Status                          : running

    IP-SLA session cumulative counters
       Total Probes Transmitted        : 1
       Probes Timed-out                : 0
       Bind Error                      : 0
       Destination Address Unreachable : 0
       DNS Resolution Failures         : 0
       Reception Error                 : 0
       Transmission Error              : 0

    IP-SLA Latest Probe Results
       Last Probe Time                 : 2018 Jul 13 02:00:35
       Packets Sent                    : 1
       Packets Received                : 1
       Packet Loss in Test             : 0.0000%

    Minimum RTT(ms)                    : 12
    Maximum RTT(ms)                    : 12
    Average RTT(ms)                    : 12
    DNS RTT(ms)                        : 0
    TCP RTT(ms)                        : 12

switch(config)# show ip-sla xyz
    IP-SLA Name             : xyz
    Status                  : scheduled
    IP-SLA Type             : tcp-connect
    VRF                     : ipslasrc
    Source Port             : 5555
    Source IP               : 2.2.2.2
    Source Interface        :
    Domain Name Server      :
    Probe interval(seconds) : 90


switch(config)# show ip-sla jitter-sla results
    IP-SLA session status
       IP-SLA Name                     : jitter-sla
       IP-SLA Type                     : udp-jitter-voip
       Destination Host Name/IP Address: 2.2.2.1
       Destination Port                : 8888
       Source IP Address/IFName        :
       Source Port                     : 5555
       Status                          : running

    IP-SLA Session Cumulative Counters
       Total Probes Transmitted        : 1
       Probes Timed-out                : 0
       Bind Error                      : 0
       Destination Address Unreachable : 0
       DNS Resolution Failures         : 0
       Reception Error                 : 0
       Transmission Error              : 0

    IP-SLA Latest Probe Results
       Last Probe Time                 : 2018 Jul 13 02:02:48
       Packets Sent                    : 1
       Packets Received                : 1
       Packet Loss in Test             : 0.0000%

       Minimum RTT(ms)                 : 1
       Maximum RTT(ms)                 : 1
       Average RTT(ms)                 : 1
       DNS RTT(ms)                     : 0

       Min Positive SD                 : 1      Min Positive DS        : 2
       Max Positive SD                 : 1      Max Positive DS        : 2
       Positive SD Number              : 2      Positive DS Number     : 2
       Positive SD Sum                 : 2      Positive DS Sum        : 4
       Positive SD Average             : 5      Positive DS Average    : 5
       Min Negative SD                 : 1      Min Negative DS        : 1
       Max Negative SD                 : 1      Max Negative DS        : 1
       Negative SD Number              : 2      Negative DS Number     : 4
       Negative SD Sum                 : 2      Negative DS Sum        : 4
       Negative SD Average             : 5      Negative DS Average    : 5

       Max SD Delay                    : 0      Max DS Delay           : 0
       Min SD Delay                    : 0      Min DS Delay           : 0
       Average SD Delay                : 0      Average DS Delay       : 0

    Voice Scores:
       MOS  Score                      : 4.38   ICPIF                  : 0


switch(config)# show ip-sla m3op
    IP-SLA Name             : jitter-sla
    Status                  : running
    IP-SLA Type             : udp-jitter-voip
    VRF                     : ipslasrc
    Source IP               : 2.2.2.2
    Source Interface        :
    Domain Name Server      :
    TOS                     : 10
    Probe Interval(seconds) : 90
    Advantage Factor        : 0
    Codec Type              : g711a


switch(config)# show ip-sla https-sla
    SLA Name                : https-sla
    Status                  : running
    SLA Type                : https
    VRF                     : default
    Source Port             : 1027
    Source IP               : 1.1.1.1
    Source Interface        :
    Domain Name Server      :
    Probe Interval(seconds) : 60
    HTTPS Request Type      : raw
    HTTPS URL               : https://1.1.1.2
    Cache                   : Enabled
    HTTPS Proxy URL         :
    HTTP Version Number     :

switch(config)# show ip-sla all

IP-SLA session status
IP-SLA Name                          : 707 (non-persistent)
```

~~~
IP-SLA Type                          : https
Destination Host Name/IP Address     : NA
Destination Port                     : NA
Source IP Address/IFName             :
Source Port                          :
Status                               : running



IP-SLA Session Cumulative Counters
Total Probes Transmitted             : 1
Probes Timed-out                     : 0
Bind Error                           : 0
Destination Address Unreachable      : 0
DNS Resolution Failures              : 0
Reception Error                      : 0
Transmission Error                   : 0



IP-SLA Latest Probe Results
Last Probe Time                      : 2023 Jun 05 13:10:19
Packets Sent                         : 1
Packets Received                     : 1
Packet Loss in Test                  : 0.0000%



Minimum RTT(ms)                      : 20
Maximum RTT(ms)                      : 20
Average RTT(ms)                      : 20
DNS RTT(ms)                          : 0
TCP RTT(ms)                          : 12
TLS RTT(ms)                          : 8

switch(config)# show ip-sla http-sla
    IP-SLA Name             : http-sla
    Status                  : running
    IP-SLA Type             : http
    VRF                     : ipslasrc
    Source IP               : 2.2.2.2
    Source Interface        :
    Domain Name Server      : 10.10.10.2
    Probe Interval(seconds) : 90
    HTTP Request Type       : get
    HTTP/HTTPS URL          : abcd.com/ws/home
    Cache                   : Enabled
    HTTP Proxy URL          :
    HTTP Version Number     : 1.1
    ```

##### IP-SLA status description
    ```
    | Status                   | Description                                      |
    |--------------------------|--------------------------------------------------|
    | running                  | SLA is fully operational                         |
    | Bind Error               | Another service is using the same source port  |
    | Interface Down           | Interface status is not up
    | Dns Resolution Error     | Failed to resolve destination hostname         |
    | No Route                 | No available route to the responder            |
    | Internal Error           | Unexpected error prevents SLA session          |
    | Disabled                 | SLA is disabled                                |
~~~

~~~
    |Configuration Incomplete | Configuration is not complete to enable the SLA|
    ```
##### IP SLA session cumulative counters description
    ```
    | Status                          | Description
                              |
    |--------------------------------|--------------------------------------------
------------------------------|
    |Probes Timed-out                | Total numbers of probes failed to receive
response.                         |
    |Bind Error                      | Total numbers of probes transmission failed
as source port not available.|
    |Destination Address Unreachable | Total numbers of probes transmission failed
due to route unavailable.    |
    |DNS Resolution Failures         | Total numbers of probes failed due to DNS
resolution failure.           |
    |Reception Error                 | Total numbers of probes failed due to
internal error in reception.        |
    |Transmission Error              | Total numbers of probes failed due to
internal errr in transmission.      |
~~~

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.12.1000	Updated to display **https** as an IP-SLA type.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

start-test

```
start-test
```

Description

Starts the IP-SLA probes.

Examples

```
switch(config)# ip-sla test
switch(config-ip-sla-test)# start-test
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

stop-test

```
stop-test
```

Description

Stops the IP-SLA probes.

Examples

```
switch(config)# ip-sla test
switch(config-ip-sla-test)# stop-test
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

tcp-connect

```
tcp-connect {<DEST-IPV4-ADDR> | <HOSTNAME>} <PORT-NUM> [source {<SOURCE-IPV4-ADDR> |
     <IFNAME>} [source-port <PORT-NUM>]] [name-server <IPV4-ADDR-DNS-SERVER>]
     [probe-interval <PROBE-INTERVAL>]
```

Description

Configures TCP connect as the IP-SLA test mechanism. Requires destination address/hostname and destination port for the IP-SLA of tcp-connect IP-SLA type.

Parameter	Description
`{<DEST-IPV4-ADDR> | <HOSTNAME>}`	Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.
`<PORT-NUM>`	Destination port for the IP-SLA. Range: 1 to 65535.
`[source {<SOURCE-IPV4-ADDR> | <IFNAME>}]`	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
`[source-port <PORT-NUM>]`	Specifies the port for the IP-SLA test.
`[name-server <IPV4-ADDR-DNS-SERVER>]`	Specifies the DNS server for destination hostname resolution.
`[probe-interval <PROBE-INTERVAL>]`	Probe interval in seconds. Range: 30 to 604800.

Examples

```
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080 source 2.2.2.1 source-port 6000
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080 source 1/1/1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080 source
2.2.2.1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080 source
1/1/1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080 name-
server 10.10.10.2
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

udp-echo

```
udp-echo {<DEST-IPV4-ADDR>|<HOSTNAME>} <PORT-NUM> [source {<SOURCE-IPV4-ADDR> |
     <IFNAME>} [source-port <PORT-NUM>]] [name-server <IPV4-ADDR-DNS-SERVER>] [payload-
size
     <PAYLOAD-SIZE>] [tos <TYPE-OF-SERVICE>] [probe-interval <PROBE-INTERVAL>]
```

Description

Configures UDP echo as the IP-SLA test mechanism. Requires destination address/hostname and destination port number for the IP-SLA of udp-echo SLA type.

Parameter	Description
`{<DEST-IPV4-ADDR> | <HOSTNAME>}`	Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.
`<PORT-NUM>`	Specifies the destination port for the IP-SLA. Range: 1 to 65535.
`[source {<SOURCE-IPV4-ADDR> | <IFNAME>}]`	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
`[source-port <PORT-NUM>]`	Specifies source port for the IP-SLA test. Range: 1 to 65535.
`[name-server <IPV4-ADDR-DNS-SERVER>]`	Specifies the DNS server for destination hostname resolution.
`[payload-size <PAYLOAD-SIZE>]`	Specifies the payload size of an SLA probe. Range: 28 to 1440.
`[<TYPE-OF-SERVICE>]`	Type of service. Range: 0 to 255.
`probe-interval <PROBE-INTERVAL>`	Probe interval in seconds. Range: 5 to 604800.

Examples

```
switch(config-ipsla-1)# udp-echo 2.2.2.2 8080
    switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 2.2.2.1
    switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080
    switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 1/1/1
    switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 2.2.2.1 payload-size 50
    switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 1/1/1 payload-size 50
    switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 payload-size 50
    switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080 source
2.2.2.1
     payload-size 50
    switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080 source
1/1/1
     payload-size 50
    switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080
     name-server 10.10.10.2
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

udp-jitter-voip

```
udp-jitter-voip {<DEST-IPV4-ADDR> | <HOSTNAME>} <PORT-NUM> [codec-type <CODEC-TYPE>]
     [advantage-factor <VALUE>] [source {<SOURCE-IPV4-ADDR> | <IFNAME>} [source-port
<PORT-NUM>]]
     [name-server <IPV4-ADDR-DNS-SERVER>][probe-interval <PROBE-INTERVAL>] [tos <TYPE-OF-
SERVICE>]
```

Description

Configure UDP jitter voip as the IP-SLA test mechanism. Requires destination address/hostname and source address/interface for the IP-SLA of udp-jitter-voip IP-SLA type.

Parameter	Description
`{<DEST-IPV4-ADDR>|<HOSTNAME>}`	Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.
`<PORT-NUM>`	Selects the port number for the IP-SLA. Range: 1 to 65535.
`[codec-type <CODEC-TYPE>]`	Selects the codec-type for the Voip IP-SLA test.
`[advantage-factor <ADVANTAGE-FACTOR>]`	Selects the value for the advantage factor. Default value is 0.
`[source {<SOURCE-IPV4-ADDR>	<IFNAME>}]`	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
`[source-port <PORT-NUM>]`	Specifies the value of source port for the IP-SLA probes.
`[name-server <IPV4-ADDR-DNS-SERVER>]`	Specifies the DNS server for destination hostname resolution.
`tos <TYPE-OF-SERVICE>`	Specifies the type of service. Range: 0 to 255.
`probe-interval <PROBE-INTERVAL>`	Specifies the probe interval in seconds. Range: 120 to 604800.

Examples

```
switch(config-ipsla-1)# udp-jitter-voip  2.2.2.2 8080 advantage-factor 10 codec-
type g711a
    switch(config-ipsla-1)# udp-jitter-voip  2.2.2.2 8080 advantage-factor 10
codec-type g711a source 2.2.2.1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a
    switch(config-ipsla-1)# udp-jitter-voip  2.2.2.2 8080 advantage-factor 10
```

```
codec-type g711a source 1/1/1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a source 2.2.2.1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a source 1/1/1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a name-server 10.10.10.2 probe-interval 120
source 10.1.1.1 source-port 8888 tos 10
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

vrf

```
vrf <VRF-NAME>
no vrf [<VRF-NAME>]
```

Description

Configures the VRF on which the SLA will send or receive packets. By default, the default VRF is used.

The **no** form of the command removes VRF from SLA.

Parameter	Description
<VRF-NAME>	Specifies a VRF name. Length: Default: default.

Examples

```
switch(config-ip-sla-test)# vrf ipslasrc
```

```
switch(config-ip-sla-test)# no vrf
```

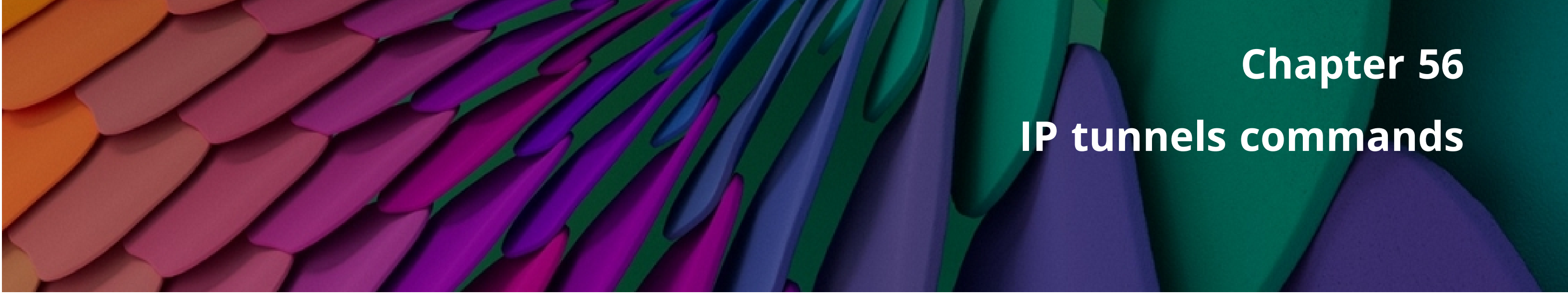
For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.



Chapter 56
IP tunnels commands

description

```
description <DESC>
no description
```

Description

Associates a text description with an IP tunnel for identification purposes.

The **no** form of this command removes the description from an IP tunnel.

Parameter	Description
<DESC>	Specifies the descriptive text to associate with the IP tunnel. Range: 1 to 64 printable ASCII characters.

Examples

Defines a description for GRE tunnel **33**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# description Network A Tunnel C
```

Removes the description for GRE tunnel **33**.

```
switch(config)# interface tunnel 33
switch(config-gre-if)# no description
```

Defines a description for IPv6 in IPv4 tunnel **27**.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# description Network 3 Tunnel 27
```

Removes the description for IPv6 in IPv4 tunnel **27**.

```
switch(config)# interface tunnel 27
switch(config-ip-if)# no description
```

Defines a description for IPv6 in IPv6 tunnel **8**.

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)# description Network 4 Tunnel 8
```

Removes the description for IPv6 in IPv6 tunnel **8**.

```
switch(config)# interface tunnel 8
switch(config-ip-if)# no description
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if` `config-ip-if`	Administrators or local user group members with execution rights for this command.

destination ip

```
destination ip <IPV4-ADDR>
no destination ip <IPV4-ADDR>
```

Description

Sets the destination IP address for an IP tunnel. Specify the address of the interface on the remote device to which the tunnel will be established.

The **no** form of this command deletes the destination IP address from an IP tunnel.

Parameter	Description
<IPV4-ADDR>	Specifies the destination IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Examples

Defines the destination IP address to be **10.10.10.1** for GRE tunnel **33**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# destination ip 10.10.10.1
```

Deletes the destination IP address **10.10.10.1** from GRE tunnel **33**.

```
switch(config)# interface tunnel 33
 switch(config-gre-if)# no destination ip 10.10.10.1
```

Defines the destination IP address to be **10.10.20.1** for IPv6 in IPv4 tunnel **27**.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# destination ip 10.10.20.1
```

Deletes the destination IP address **10.10.20.1** from IPv6 in IPv4 tunnel **27**.

```
switch(config)# interface tunnel 27
 switch(config-ip-if)# no destination ip 10.10.20.1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if` `config-ip-if`	Administrators or local user group members with execution rights for this command.

destination ipv6

```
destination ipv6 <IPVv6-ADDR>
no destination ipv6 [IPV6-ADDR]
```

Description

Sets the destination IPv6 address for an IP tunnel. Specify the address of the interface on the remote device to which the tunnel will be established.

The **no** form of this command deletes the destination IPv6 address from an IP tunnel.

Parameter	Description
<IPV6-ADDR>	Specifies the tunnel IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. This is optional in the **no** form of the command.

Examples

Defines the destination IPv6 address to be **2001:DB8::1** for IPv6 in IPv6 tunnel

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)# destination ipv6 2001:DB8::1
```

Deletes the destination IPv6 address **2001:DB8::1** from IPv6 in IPv6 tunnel **8**.

```
switch(config)# interface tunnel 8
switch(config-ip-if)# no destination ipv6 2001:DB8::1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-if`	Administrators or local user group members with execution rights for this command.

interface tunnel

```
interface tunnel <TUNNEL-NUMBER> mode {gre ip | ip 6in4 | ip 6in6 |ipsec ipv4}
interface tunnel <EXISTING-TUNNEL-NUMBER>
no interface tunnel <EXISTING-TUNNEL-NUMBER> [mode {gre ip | ip 6in4 | ip 6in6}]
```

Description

Creates or updates an IP tunnel. After you enter the command, the firmware switches to the configuration context for the tunnel.

If the specified tunnel exists, this command switches to the context for the tunnel.

By default, all tunnels are automatically assigned to the default VRF when they are created.

The **no** form of this command deletes an existing IP tunnel. It is optional to include a mode in the **no** form, but if a mode has been entered, selecting a mode is required.

Parameter	Description
`mode {gre ip | ip 6in4 | ip 6in6}`	Creates an IP tunnel. Choose one of the following options: - **gre ip**: Creates a GRE tunnel. - **ip 6in4**: Creates an IPv4 tunnel for IPv6 traffic. - **ip 6in6**: Creates an IPv6 tunnel for IPv6 traffic. This is optional in the **no** form, unless a mode has already been entered.
<TUNNEL-NUMBER>	Specifies the number for a new tunnel. Range: 1 to 127. Numbering is shared between all tunnels, so the same tunnel number cannot be used for an IPv6 in IPv4 tunnel and a GRE tunnel.
<EXISTING-TUNNEL-NUMBER>	Specifies the number for an existing IP tunnel. Range: 1 to 127.

Examples

Defines a new GRE tunnel with number **27**.

```
switch(config)# interface tunnel 27 mode gre ip
switch(config-gre-if)#
```

Switches to the `config-gre-if` context for existing tunnel **33**.

```
switch(config)# interface tunnel 33
switch(config-gre-if)#
```

Deletes GRE tunnel **33**.

```
switch(config)# no interface tunnel 33
```

Defines a new IPv6 in IPv4 tunnel with number **27**.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)#
```

Switches to the `config-ip-if` context for existing tunnel **27**.

```
switch(config)# interface tunnel 27
switch(config-ip-if)#
```

DeletesIPv6 in IPv4 tunnel **27**.

```
switch(config)# no interface tunnel 27
```

Defines a new IPv6 in IPv6 tunnel with number **8**.

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)#
```

Deletes IPv6 in IPv6 tunnel with number **3**.

```
switch(config)# no interface tunnel 3 mode gre ip
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	The **ipv4** parameter is deprecated and replaced with **ip**.

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-gre-if`
	`config-ip-if`
	`config`
		Administrators or local user group members with execution rights for this command.

ip address

```
ip address <IPV4-ADDR>/<MASK>
no ip address <IPV4-ADDR>/<MASK>
```

Description

Sets the local IP address of a GRE tunnel. This address identifies the tunnel interface for routing. It must be on the same subnet as the tunnel address assigned on the remote device.

The **no** form of this command deletes the local IP address assigned to a GRE tunnel.

Parameter	Description
<IPV4-ADDR>	Specifies the tunnel IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address **192.169.005.100** becomes **192.168.5.100**.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32.

Examples

Defines the local IP address **10.10.10.1** for GRE tunnel **33**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# ip address 10.10.10.1/24
```

Deletes the local IP address **10.10.10.1** for GRE tunnel 33.

```
switch(config)# interface tunnel 33
switch(config-gre-if)# no ip address 10.10.10.1/24
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if`	Administrators or local user group members with execution rights for this command.

ipv6 address

```
ipv6 address <IPV6-ADDR>/<MASK>
no ipv6 address <IPV6-ADDR>/<MASK>
```

Description

Sets the local IP address of an IPv6 to IPv4 tunnel or of an IPv6 to IPv6 tunnel. This address identifies the tunnel interface for routing. It must be on the same subnet as the tunnel address assigned on the remote device.

The **no** form of this command deletes the local IP address assigned to an IPv6 to IPv4 tunnel.

Parameter	Description
<IPV6-ADDR>	Specifies the tunnel IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32.

Examples

Defines the local IP address **2001:DB8:5::1/64** for tunnel **8** for an IPv6 to IPv6 tunnel.

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)# ipv6 address 2001:DB8:5::1/64
```

Deletes the local IP address **2001:DB8::1/32** for tunnel **8**.

```
switch(config)# interface tunnel 8
switch(config-ip-if)# no ipv6 address 2001:DB8:5::1/64
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-if` `config-if`	Administrators or local user group members with execution rights for this command.

ip mtu

```
ip mtu <VALUE>
```

Description

Sets the MTU (maximum transmission unit) for an IP interface. The default value is 1500 bytes.

The **no** form of this command sets the MTU to the default value of 1500 bytes.

Parameter	Description
<VALUE>	Specifies the MTU in bytes. Range: 1,280 bytes to 9,192 bytes.

Usage

The IP MTU is the largest IP packet that can be sent or received by the interface. For a tunnel, the IP MTU is the maximum size of the IP payload. To enable jumbo packet forwarding through the tunnel, set the IP MTU of the tunnel to a value greater than 1500. Also set the MTU and the IP MTU values for the underlying physical interface that the tunnel is using to a value greater than 1,500 bytes. The IP MTU of the tunnel must also be greater than or equal to the MTU of the ingress interface on the switch. The IP MTU value of the tunnel must also be less than or equal to the IP MT of the underlying interface that the tunnel is using.

When defining a GRE tunnel, the MTU has to account for 28 bytes of IP layer overhead, plus a GRE header. It must be larger than the MTU of the interface that the tunnel is using. Packets larger than the MTU are dropped.

Examples

Sets the MTU on GRE interface **33** to **1300** bytes.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# mtu 1300
```

Sets the MTU on GRE interface **33** to the default value.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# ip mtu
```

Sets the MTU on IPv6 in IPv4 tunnel **27** to **1000** bytes.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# mtu 1000
```

Sets the MTU onIPv6 in IPv4 tunnel **27** to the default value.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# ip mtu
```

Sets the MTU on IPv6 in IPv6 tunnel **8** to **900** bytes.

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)# ip mtu 9000
```

Sets the MTU on IPv6 in IPv6 tunnel **8** to the default value.

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)# ip mtu
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if` `config-ip-if`	Administrators or local user group members with execution rights for this command.

show interface tunnel

`show interface tunnel[<TUNNEL-NUMBER>] [vsx-peer]`

Description

Shows configuration settings for all IP tunnels, or a specific tunnel.

Parameter	Description
<TUNNEL-NUMBER>	Specifies the number of an IP tunnel. Range: 1 to 127.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Shows configuration settings for tunnel **10**, which is a GRE tunnel in the following example.

```
switch# show interface tunnel10

Interface tunnel10 is up
 Admin state is up
 tunnel type GRE IP
 tunnel interface IP address 192.0.2.0/24
 tunnel source IP address 1.1.1.1
 tunnel destination IP address 2.2.2.2
 tunnel ttl 60

Statistics                      RX                   TX                 Total
 ------------- -------------------- -------------------- --------------------
 L3 Packets                       0                    0                    0
 L3 Bytes                         0                    0                    0
```

Shows configuration settings for tunnel **12**, which is an IPv6 in IPv6 tunnel in the following example.

```
switch# show interface tunnel12

Interface tunnel12 is up
 Admin state is up
 tunnel type IPv6 in IPv6
 tunnel interface IPv6 address 4::1/64
 tunnel source IPv6 address 2::1
 tunnel destination IPv6 address 2::2
 tunnel ttl 60
 Description: Network2 Tunnel

Statistics                      RX                   TX                 Total
 ------------- -------------------- -------------------- --------------------
 L3 Packets                       0                    0                    0
 L3 Bytes                         0                    0                    0
```

Shows configuration settings for all tunnels.

```
switch# show interface tunnel

Interface tunnel10 is up
 Admin state is up
 tunnel type GRE IP
 tunnel interface IP address 192.0.2.0/24
 tunnel source IP address 1.1.1.1
 tunnel destination IP address 2.2.2.2
 tunnel ttl 60

Statistics                      RX                   TX                 Total
 ------------- -------------------- -------------------- --------------------
 L3 Packets                       0                    0                    0
 L3 Bytes                         0                    0                    0

Interface tunnel11 is up
 Admin state is up
 tunnel type IPv6 in IPv4
 tunnel source IPv4 address 198.51.100.0
 tunnel destination IPv4 address 198.51.200.5
 tunnel ttl 80
 Description: Network11

Statistics                      RX                   TX                 Total
 ------------- -------------------- -------------------- --------------------
 L3 Packets                       0                    0                    0
 L3 Bytes                         0                    0                    0

Interface tunnel12 is up
 Admin state is up
 tunnel type IPv6 in IPv6
 tunnel interface IPv6 address 4::1/64
 tunnel source IPv6 address 2::1
 tunnel destination IPv6 address 2::2
 tunnel ttl 60
 Description: Network2 Tunnel

Statistics                      RX                   TX                 Total
 ------------- -------------------- -------------------- --------------------
 L3 Packets                       0                    0                    0
 L3 Bytes                         0                    0                    0
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config interface tunnel

`show running-config interface tunnel<TUNNEL-NUMBER> [vsx-peer]`

Description

Shows the commands used to configure a tunnel.

Parameter	Description
<TUNNEL-NUMBER>	Specifies the number of an IP tunnel. Range: 1 to 127.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Shows the configuration for a GRE tunnel.

```
switch# show running-config interface tunnel2
  interface tunnel 2 mode gre ipv4
  source ip 10.10.20.11
  destination ip 10.20.1.2
  ip address 10.10.10.1/24
  ttl 60
```

Shows the configuration for IPv6 in IPv4 tunnel.

```
switch# show running-config interface tunnel5
  interface tunnel5 mode ip 6in4
  source ip 10.10.10.12
  destination ip 22.20.20.20
  ip6 address 2001:DB8:5::1/64
  ttl 60
  no shutdown
  description Network10
```

Shows the configuration for IPv6 in IPv6 tunnel.

```
switch# show running-config interface tunnel1
  interface tunnel 1 mode ip 6in6
  description Network2 Tunnel
  source ipv6 2::1
  destination ipv6 2::2
  ipv6 address 4::1/64
  ttl 60
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

shutdown

```
shutdown
no shutdown
```

Description

This command disables an IP interface. IP interfaces are disabled by default when created.

The **no** form of this command enables an IP interface.

Examples

Enables GRE interface **33**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# no shutdown
```

Disables GRE interface **33**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# shutdown
```

Enables IPv6 in IPv4 interface **27**.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# no shutdown
```

Disables IPv6 in IPv4 interface **27**.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# shutdown
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if` `config-ip-if`	Administrators or local user group members with execution rights for this command.

source ip

```
source ip <IPV4-ADDR>
no source ip <IPV4-ADDR>
```

Description

Sets the source IP address for an IP tunnel. Specify the IP address of a layer 3 interface on the switch. Tunnels can have the same source IP address and different destination IP addresses.

The **no** form of this command deletes the source IP address for an IP tunnel.

Parameter	Description
<IPV4-ADDR>	Specifies the source IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Examples

Defines the source IP address to be **10.10.20.1** for GRE tunnel **33**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# source ip 10.10.20.1
```

Deletes the source IP address **10.1.20.1** from GRE tunnel **33**.

```
switch(config)# interface tunnel 33
switch(config-gre-if)# no source ip 10.10.20.1
```

Defines the source IP address to be **10.10.10.1** for IPv6 in IPv4 tunnel **27**.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# source ip 10.10.10.1
```

Deletes the source IP address **10.1.10.1** from IPv6 in IPv4 tunnel **27**.

```
switch(config)# interface tunnel 27
switch(config-ip-if)# no source ip 10.10.10.1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if` `config-ip-if`	Administrators or local user group members with execution rights for this command.

source ipv6

```
source ipv6 <IPV6-ADDR>
no source ipv6 [IPV6-ADDR]
```

Description

Sets the source IPv6 address to be used for the encapsulation.

The **no** form of this command deletes the source IPv6 address for an IP tunnel.

Parameter	Description
<IPV6-ADDR>	Specifies the tunnel IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. This is optional in the **no** form of the command.

Examples

Defines the source IPv6 address to be **2001:DB8::1** for IPv6 in IPv6 tunnel **8**.

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)# source ipv6 2001:DB8::1
```

Deletes the source IP address **2001:DB8::1** from IPv6 in IPv6 tunnel **8**.

```
switch(config)# interface tunnel 8
switch(config-ip-if)# no source ipv6 2001:DB8::1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ip-if`	Administrators or local user group members with execution rights for this command.

ttl

```
ttl <COUNT>
no ttl
```

Description

Sets the TTL (time-to-live), also known as the hop count, for tunneled packets. If not configured, the default value of 64 is used for the tunnel. (The hop count of the original packets is not changed.) A maximum of four different TTL values can be used at the same time by all tunnels on the switch. For example, if tunnel-1 has TTL 10, tunnel-2 has TTL 20, tunnel-3 has TTL 30, and tunnel-4 has TTL 40, then tunnel-5 cannot have a unique TTL value, it must reuse one of the values assigned to the other tunnels (10, 20, 30, 40).

The **no** form of this command sets TTL to the default value of 64.

Parameter	Description
<COUNT>	Specifies the hop count. Range: 1 to 255. Default: 64.

Examples

Defines a TTL of **99** for GRE tunnel **33**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# ttl 99
```

Sets the TTL for GRE tunnel **33** to the default value of 64.

```
switch(config)# interface tunnel 33
switch(config-gre-if)# no ttl
```

Defines a TTL of **55** for IPv6 in IPv4 tunnel **27**.

```
switch(config)# interface tunnel 27 mode ip 6in4
switch(config-ip-if)# ttl 55
```

Sets the TTL for IPv6 in IPv4 tunnel **27** to the default value of 64.

```
switch(config)# interface tunnel 27
switch(config-ip-if)# no ttl
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if` `config-ip-if`	Administrators or local user group members with execution rights for this command.

vrf attach

```
vrf attach <VRF-NAME>
no vrf attach <VRF-NAME>
```

Description

Assigns an IP tunnel to a VRF. By default, all tunnels are automatically assigned to the default VRF when they are created.

The **no** form of this command assigns a tunnel to the default VRF (**default**).

Parameter	Description
<VRF-NAME>	Specifies the VRF name to which to assign the tunnel.

Examples

Assigns GRE tunnel **33** to **vrf1**.

```
switch(config)# interface tunnel 33 mode gre ipv4
switch(config-gre-if)# vrf attach vrf1
```

Reassigns GRE tunnel **33** to the default VRF.

```
switch(config)# interface tunnel 33
switch(config-gre-if)# no vrf attach vrf1
```

Assigns IPv6 in IPv4 tunnel **27** to **vrf2**.

```
switch(config)# interface tunnel 27 mode gre ipv4
switch(config-ip-if)# vrf attach vrf2
```

Reassigns IPv6 in IPv4 tunnel **27** to the default VRF.

```
switch(config)# interface tunnel 27
switch(config-ip-if)# no vrf attach vrf2
```

Assigns IPv6 in IPv6 tunnel **8** to **vrf3**.

```
switch(config)# interface tunnel 8 mode ip 6in6
switch(config-ip-if)# vrf attach vrf3
```

Reassigns IPv6 in IPv6 tunnel **8** to the default VRF.

```
switch(config)# interface tunnel 8
switch(config-ip-if)# no vrf attach vrf3
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-gre-if` `config-ip-if`	Administrators or local user group members with execution rights for this command.

IP source lockdown commands

IP source lockdown resource extended

```
[no] ip source-lockdown resource-extended
```

Description

Enables and disables IP source lockdown resource extended on the device. It supports dynamically sharing hardware resources of IP source lockdown with other features.

For example, on AOS-CX 6300 switches, 8000 IP source lockdown entries can be programmed in the hardware by default. By disabling IP resource-extended, the supported value will reduce to 4000, and the remaining resources are shared with other features.

If the resource-extended feature is disabled, all the existing IP source-bindings are flushed from the hardware and reprogrammed. As a result, some existing bindings do not get programmed to hardware, which existed before the configuration change. There is a disruption in traffic flow from the client during this transition.

The command is supported on 6300, 6400v1, and 6400v2 but not supported on 6400v2 extended profile.

Examples

The following example enables IP source lockdown resource extended globally:

```
switch(config)# ip source-lockdown resource-extended
   Do you want to continue (y/n)? y
```

On enabling IP source lockdown resource extended , application recognition gets disabled and stops sharing IP lockdown hardware resources.

The following example disables IP source lockdown resource extended globally:

```
switch(config)# no ip source-lockdown resource-extended
   Do you want to continue (y/n)? y
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced for 6300 and 6400 series switches.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

Chapter 57
IPv4 source lockdown commands

ipv4 source-binding

```
ipv4 source-binding <VLAN-ID> <IPV4-ADDR> <MAC-ADDR> <IFNAME>
no ipv4 source-binding <VLAN-ID> <IPV4-ADDR> <MAC-ADDR> <IFNAME>
```

Description

Adds static IPv4 client source binding information to the switch IP binding database. Although DHCPv4 snooping is often used to dynamically populate the binding database, this command is available for manually adding entries to the switch IP binding database.

Statically configured IP binding information supersedes any dynamically collected binding information for the same client.

The no form of this command removes the specified binding that was statically configured with the **ipv4 source-binding** command. The no form has no effect on bindings that were dynamically configured with DHCPv4 snooping.

Parameter	Description
<VLAN-ID>	Specifies the ID of an existing VLAN on which the client is connected. Range: 1 to 4094.
<IPV4-ADDR>	Specifies the client IPv4 unicast address.
<MAC-ADDR>	Specifies the client MAC address.
<IFNAME>	Specifies the interface on which the client is connected.

Examples

On the 6400 Switch Series, interface identification differs.

Adding a static IPv4 binding:

```
switch(config)# ipv4 source-binding 1 10.2.1.4 00:50:56:96:e4:cf 1/1/1
```

Removing a IPv4 binding:

```
switch(config)# no ipv4 source-binding 1 10.2.1.4 00:50:56:96:e4:cf 1/1/1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ipv4 source-lockdown

```
ipv4 source-lockdown
no ipv4 source-lockdown
```

Description

Enables IPv4 source lockdown for all VLANs on the selected interface (port).

The no form of this command disables IPv4 source lockdown for the selected interface (port).

This configuration will disable flow tracking statistics collection.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling IPv4 source lockdown on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv4 source-lockdown
```

Enabling IPv4 source lockdown on interface lag112:

```
switch(config)# interface lag112
switch(config-if)# ipv4 source-lockdown
```

Disabling IPv4 source lockdown on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no ipv4 source-lockdown
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	Added information related to role based IPFIX.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

ipv4 source-lockdown hardware retry

`ipv4 source-lockdown hardware retry <VLAN-ID> <IPV4-ADDR>`

Description

Retries the IPv4 source lockdown hardware programming for a client identified by VLAN and IPv4 address.

Parameter	Description
<VLAN-ID>	Specifies the ID of an existing VLAN on which the client is connected. Range: 1 to 4094.
<IPV4-ADDR>	Specifies the client IPv4 unicast address.

Example

Configure IPv4 source lockdown hardware retry for the client on VLAN 10.

```
switch(config)# ipv4 source-lockdown hardware retry 10 1.1.2.1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ipv4 source-binding

```
show ipv4 source-binding [vsx-peer]
```

Description

Shows all IPv4 static source binding information irrespective of source lockdown configuration..

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing all IPv4 source binding information:

```
switch# show ipv4 source-binding

  PORT             VLAN        MAC-ADDRESS        HW-STATUS  FROM      IPv4-ADDRESS
  ---------------  ---------   -----------------  ---------  --------  -------------
  1/1/1            2           aa:bb:cc:dd:ee:ff  Yes        static    1.2.3.4
  1/1/2            12          aa:ab:cc:dd:ee:ff  Yes        static    10.20.30.40
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv4 source-lockdown

```
show ipv4 source-lockdown [binding [interface <IFNAME> | ip <IPV4-ADDR> | mac <MAC-ADDR>
| vlan <VLAN-ID>] | interface <IFNAME>] [vsx-peer]
```

Description

Shows summary or detailed IPv4 source lockdown information. When entered without parameters, summary status information for all interfaces (ports) in the binding database is shown.

Parameter	Description
`binding`	Specifies that detailed lockdown binding record information is to be displayed. The binding database record can be identified by any one of **interface** (port), **ip**, **mac**, or **vlan**.
`interface` *<IFNAME>*	Specifies the client interface (port). When entered without the **binding** parameter, the summary status information is displayed for the specified interface.
`ip` *<IPV4-ADDR>*	Specifies the client IPv4 unicast address.
`mac` *<MAC-ADDR>*	Specifies the client MAC address.
`vlan` *<VLAN-ID>*	Specifies the ID of an existing VLAN on which the client is connected. Range: 1 to 4094.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the summary status information for all interfaces in the binding database:

```
switch# show ipv4 source-lockdown

  INTERFACE  LOCKDOWN  HW-STATUS
  ---------  --------  ---------
  1/1/1      Yes       Yes
  1/1/2      Yes       No
  lag112     Yes       Yes
```

Showing the summary status information for the specified interface in the binding database:

```
switch# show ipv4 source-lockdown interface 1/1/2

  INTERFACE  LOCKDOWN  HW-STATUS
  ---------  --------  ---------
  1/1/2      Yes        No
```

Showing the detailed binding record and related information for all interfaces in the binding database:

```
switch# show ipv4 source-lockdown binding

 Interface Name        : 1/1/1
 VLAN Id               : 2000
 MAC Address           : 00:50:56:96:e4:cf
 IP Address            : 192.168.142.113
 Time Remaining        : static
 Lockdown Status       : Yes
 Hardware Status       : Yes
 Hardware Error Reason : --
 Interface Name         : 1/1/2
 VLAN Id                : 100
 MAC Address            : 00:50:56:96:04:4d
 IP Address             : 120.168.43.52
 Time Remaining         : 115 seconds
 Lockdown Status        : Yes
 Hardware Status        : No
 Hardware Error Reason : Resource unavailable

 Interface Name         : lag112
 VLAN Id                : 12
 MAC Address            : 00:50:56:96:d8:3d
 IP Address             : 120.168.76.182
 Time Remaining         : static
 Lockdown Status        : Yes
 Hardware Status        : Yes
 Hardware Error Reason : --

 Interface Name         : 1/1/1
 VLAN Id                : 2000
 MAC Address            : 00:50:56:96:e4:cf
 IP Address             : 192.168.142.113
 Time Remaining         : static
 Lockdown Status        : Yes
 Hardware Status        : Yes
 Hardware Error Reason : --

 Interface Name         : 1/1/2
 VLAN Id                : 100
 MAC Address            : 00:50:56:96:04:4d
 IP Address             : 120.168.43.52
 Time Remaining         : 115 seconds
 Lockdown Status        : Yes
 Hardware Status        : No
 Hardware Error Reason : Resource unavailable

 Interface Name         : lag112
 VLAN Id                : 12
 MAC Address            : 00:50:56:96:d8:3d
 IP Address             : 120.168.76.182
 Time Remaining         : static
 Lockdown Status        : Yes
 Hardware Status        : Yes
 Hardware Error Reason : --
```

Showing the detailed binding record and related information for interface 1/1/2:

```
switch# show ipv4 source-lockdown binding interface 1/1/2

 Interface Name         : 1/1/2
 VLAN Id                : 100
 MAC Address            : 00:50:56:96:04:4d
 IP Address             : 120.168.43.52
 Time Remaining         : 115 seconds
 Lockdown Status        : Yes
 Hardware Status        : No
 Hardware Error Reason : Resource unavailable

 Interface Name         : 1/1/2
 VLAN Id                : 100
 MAC Address            : 00:50:56:96:04:4d
 IP Address            : 120.168.43.52
 Time Remaining        : 115 seconds
 Lockdown Status       : Yes
 Hardware Status       : No
 Hardware Error Reason : Resource unavailable
```

Showing the detailed binding record and related information for interface lag112 (identified in this example command by the IP address):

```
switch# show ipv4 source-lockdown binding ip 120.168.76.182

 Interface Name        : lag112
 VLAN Id               : 12
 MAC Address           : 00:50:56:96:d8:3d
 IP Address            : 120.168.76.182
 Time Remaining        : static
 Lockdown Status       : Yes
 Hardware Status       : Yes
 Hardware Error Reason : --
```

Showing the detailed binding record and related information for interface 1/1/1 (identified in this example command by the MAC address):

```
switch# show ipv4 source-lockdown binding mac 00:50:56:96:e4:cf

 Interface Name        : 1/1/1
 VLAN Id               : 2000
 MAC Address           : 00:50:56:96:e4:cf
 IP Address            : 192.168.142.113
 Time Remaining        : static
 Lockdown Status       : Yes
 Hardware Status       : Yes
 Hardware Error Reason : --
```

Showing the detailed binding record and related information for interface 1/1/2 (identified in this example command by the VLAN):

```
switch# show ipv4 source-lockdown binding vlan 100

 Interface Name        : 1/1/2
 VLAN Id               : 100
 MAC Address           : 00:50:56:96:04:4d
 IP Address            : 120.168.43.52
 Time Remaining        : 115 seconds
 Lockdown Status       : Yes
 Hardware Status       : No
 Hardware Error Reason : Resource unavailable
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 58

IPv6 destination guard commands

ipv6 destination guard

```
ipv6 destination-guard
no ipv6 destination-guard
```

Description

Enables IPv6 destination guard on a VLAN.

The **no** form of the command removes the IPv6 destination guard from a VLAN.

> To avoid dropping valid packets when destination guard is enabled, it is recommended to configure DHCPv6 snooping and ND snooping to populate the binding database.

Examples

Enabling IPv6 destination guard policy on a VLAN:

```
switch(config)# vlan 10
switch(config-vlan-10)# ipv6 destination-guard
```

Disabling IPv6 destination guard policy on a VLAN:

```
switch(config-vlan-10)# no ipv6 destination-guard
```

> For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

show ipv6 destination-guard

```
show ipv6 destination-guard
```

Description

Shows the ipv6 destination-guard configuration.

Examples

Showing the IPv6 destination-guard configuration:

```
switch# show ipv6 destination-guard

IPv6 Destination-Guard information

Enabled VLANs         : 10,20,31-35
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 destination-guard statistics vlan

```
show ipv6 destination-guard statistics {vlan <VLAN-ID>}
```

Description

Shows IPv6 destination guard statistics for the specified VLAN.

Command context

Parameter	Description
`vlan <VLAN-ID>`	Specifies the VLAN for which all destination guard statisics are to be displayed. Range: 1 to 4094.

Examples

Showing IPv6 destination-guard statistics for VLAN 10:

```
switch# show ipv6 destination-guard statistics vlan 10
Packets dropped for VLAN 10 : 25467
```

Showing IPv6 destination-guard statistics for all VLANs:

```
switch# show ipv6 destination-guard statistics
Packets dropped for VLAN 10 : 25467
Packets dropped for VLAN 30 : 434
Packets dropped for VLAN 50 : 8767
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear ipv6 destination-guard statistics vlan

`clear ipv6 destination-guard statistics vlan <VLAN-ID>`

Description

Clears IPv6 destination guard statistics from the specified VLAN.

Command context

Parameter	Description
`vlan <VLAN-ID>`	Specifies the VLAN for which all destination guard statistics are to be cleared. Range: 1 to 4094.

Examples

Clearing all ipv6 destination-guard statistics for VLAN 10:

```
switch# clear ipv6 destination-guard statistics vlan 10
```

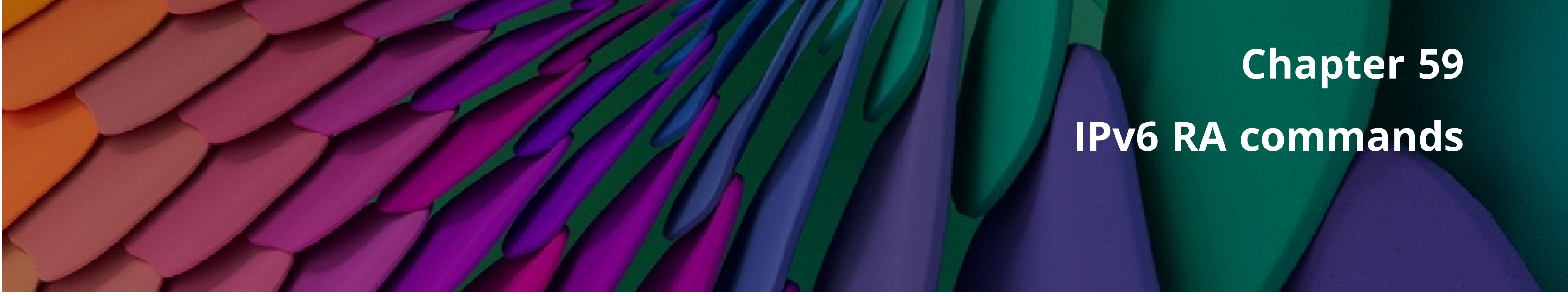
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 59

IPv6 RA commands

ipv6 address <global-unicast-address>

```
ipv6 address <global-unicast-address>
no ipv6 address <global-unicast-address>
```

Description

Sets a global unicast address on the interface.

The **no** form of this command removes the global unicast address on the interface.

This command automatically creates an IPv6 link-local address on the interface. However, it does not add the **ipv6 address link-local command** to the running configuration. If you remove the IPv6 address, the link-local address is also removed. To maintain the link-local address, you must manually execute the **ipv6 address link-local** command.

Example

On the 6400 Switch Series, interface identification differs.

Enabling a global unicast address:

```
switch(config)# interface 1/1/1
switch(config-if)#  ipv6 address 3731:54:65fe:2::a7
```

Disabling a global unicast address:

```
switch(config)# interface 1/1/1
switch(config-if)#  no ipv6 address 3731:54:65fe:2::a7
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ipv6 address autoconfig

```
ipv6 address autoconfig
no ipv6 address autoconfig
```

Description

Enables the interface to automatically obtain an IPv6 address using router advertisement information and the EUI-64 identifier.

The **no** form of this command disables address auto-configuration.

- A maximum of 15 autoconfigured addresses are supported.
- This command automatically creates an IPv6 link-local address on the interface. However, it does not add the `ipv6 address link-local` command to the running configuration. If you remove the IPv6 address, the link-local address is also removed. To maintain the link-local address, you must manually execute the `ipv6 address link-local` command.

Usage

The IPv6 SLAAC feature lets the router obtain the IPv6 address for the interface it is configured through the SLAAC method. This feature is not available on the `mgmt` VRF.

Example

On the 6400 Switch Series, interface identification differs.

Enabling unicast autoconfiguring:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 address autoconfig
```

Disabling unicast autoconfiguring:

```
switch(config)# interface 1/1/1
switch(config-if)# no ipv6 address autoconfig
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ipv6 address link-local

`ipv6 address link-local [<IPV6-ADDR>/<MASK>]`

Description

Enables IPv6 on the current interface. If no address is specified, an IPv6 link-local address is auto-generated for the interface. If an address is specified, auto-configuration is disabled and the specified address/mask is assigned to the interface.

To disable IPv6 link-local on the interface, remove **ipv6 address link-local**, **ipv6 address <global-ipv6-address>**, and **ipv6 address autoconfig** from the interface.

This feature is not available on the management VRF.

Parameter	Description
<IPV6-ADDR>	Specifies the IP address in IPv6 format **(xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx)**, where **x** is a hexadecimal number from 0 to F. You can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a hextet of four zeros to a single 0. For example, this address **2222:0000:3333:0000:0000:0000:4444:0055** becomes **2222:0:3333::4444:55**.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.

Example

On the 6400 Switch Series, interface identification differs.

Enabling IPv6 link-local on the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 address link-local
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ipv6 nd cache-limit

```
ipv6 nd cache-limit <CACHELIMIT>
no ipv6 nd cache-limit [<CACHELIMIT>]
```

Description

Configures the limit on the number of neighbor entries in the ND cache.

The **no** form of this command sets the cache limit to the default value.

Parameter	Description
<CACHELIMIT>	Specifies the neighbor cache entries limit. Range: 1-131072. Default: 131072.

Examples

Setting the cache limit to 20.

```
switch(config)# ipv6 nd cache-limit 20
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ipv6 nd dad attempts

```
ipv6 nd dad attempts <NUM-ATTEMPTS>
no ipv6 nd dad attempts [<NUM-ATTEMPTS>]
```

Description

Configures the number of neighbor solicitations to be sent when performing duplicate address detection (DAD) for a unicast address configured on an interface. If the active gateway is configured with the same IP as an SVI IP, then IPv6 DAD cannot be configured.

The **no** form of this command sets the number of attempts to the default value.

Parameter	Description
dad attempts *<NUM-ATTEMPTS>*	Specifies the number of neighbor solicitations to send. Range: 0-15. Default: 1.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd dad attempts 5
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if	Administrators or local user group members with execution rights for this command.

ipv6 nd hop-limit

```
ipv6 nd hop-limit <HOPLIMIT>
no ipv6 nd hop-limit [<HOPLIMIT>]
```

Description

Configures the hop limit to be sent in RAs.

The **no** form of this command resets the hop limit to 0. This reset eliminates the hop limit from the RAs that originate on the interface, so the host determines the hop limit.

Parameter	Description
hop-limit *<HOPLIMIT>*	Specifies the hop limit. Range: 0-255. Default: 64.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd hop-limit 64
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd mtu

```
ipv6 nd mtu <MTU-VALUE>
no ipv6 nd mtu [<MTU-VALUE>]
```

Description

Configures the MTU size to be sent in the RA messages.

The **no** form of this command sets hop limit to the default value.

Parameter	Description
<MTU-VALUE>	Specifies the MTU size. Range: 1280-65535 bytes. Default: 1500 bytes.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd mtu 1300
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ns-interval

```
ipv6 nd ns-interval <TIME>
no ipv6 nd ns-interval [<TIME>]
```

Description

Configures the ND time in milliseconds between DAD neighbor solicitations sent for an unresolved destination. Increase the ns-interval time if the network is slow or if there are persistent retry failures. If the active gateway is configured with the same IP as an SVI IP, then IPv6 DAD cannot be configured

The **no** form of this command sets the ns-interval to the default value.

Parameter	Description
<TIME>	Specifies the neighbor solicitation interval. Range: 1000-3600000 milliseconds. Default: 1000 milliseconds.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ns-interval 1200
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd prefix

```
ipv6 nd prefix <IPV6-ADDR>/<PREFIX-LEN>
     [no-advertise | [valid <LIFETIME-VALUE> preferred
     <LIFETIME-VALUE>] | no-autoconfig | no-onlink]

no ipv6 nd prefix <IPV6-ADDR>/<PREFIX-LEN> [no-advertise
     | [valid <LIFETIME-VALUE> preferred <LIFETIME-VALUE>
     ] | no-autoconfig | no-onlink]

ipv6 nd prefix default [no-advertise | [valid <LIFETIME-VALUE>
     preferred <LIFETIME-VALUE>] | no-autoconfig | no-onlink]}

no ipv6 nd prefix default [no-advertise | [valid <LIFETIME-VALUE>
     preferred <LIFETIME-VALUE>] | no-autoconfig | no-onlink]}
```

Description

Specifies prefixes for the routing switch to include in RAs transmitted on the interface. IPv6 hosts use the prefixes in RAs to autoconfigure themselves with global unicast addresses. The autoconfigured address of a host is composed of the advertised prefix and the interface identifier in the current link-local address of the host.

By default, advertise, autoconfig, and onlink are set.

The **no** form of this command removes the configuration on the interface.

Parameter	Description
<IPV6-ADDR>/<PREFIX-LEN>	Specifies the IPv6 prefix to advertise in RA. Format: X:X::X:X/M
default	Specifies apply configuration to all on-link prefixes that are not individually set by the **ipv6 ra prefix *<IPV6-ADDR>/<PREFIX-LEN>*** command. It applies the same valid and preferred lifetimes, link state, autoconfiguration state, and advertise options to the advertisements sent for all on-link prefixes that are not individually configured with a unique lifetime. This also applies to the prefixes for any global unicast addresses configured later on the same interface. Using default once, and then using it again with any new parameter values results in the new values replacing the former values in advertisements. If default is used without the **no–advertise**, **no–autoconfig**, or **no-onlink** parameter, the advertisement setting for the absent parameter is returned to its default setting.
no-advertise	Specifies do not advertise prefix in RA.
valid *<LIFETIME-VALUE>*	Specifies the total time, in seconds, the prefix remains available before becoming unusable. After preferred-lifetime expiration, any autoconfigured address is deprecated and used only for transactions only before preferred-lifetime expires. If the valid lifetime expires, the address becomes invalid. You can enter a value in seconds or enter **valid infinite** which sets infinite lifetime. Default: 2,592,000 seconds which is 30 days. Range: 0–4294967294 seconds.
preferred *<LIFETIME-VALUE>*	Specifies the span of time during which the address can be freely used as a source and destination for traffic. This setting must be less than or equal to the corresponding valid–lifetime setting. You can enter a value in seconds or enter **preferred infinite** which sets infinite lifetime. Default: 604,800 seconds which is seven days. Range: 0–4294967294 seconds.
no-autoconfig	Specifies do not use prefix for autoconfiguration.
no-onlink	Specifies do not use prefix for onlink determination.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd prefix 4001::1/64 valid 30 preferred 10 no-autoconfig
no-onlink
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra dns search-list

```
ipv6 nd ra dns search-list <DOMAIN-NAME>  [lifetime <TIME>]
no ipv6 nd ra dns search-list <DOMAIN-NAME>
```

Description

Configures the DNS Search List (DNSSL) to include in Router Advertisements (RAs) transmitted on the interface.

The **no** form of this command removes the DNS Search List from the RAs transmitted on the interface.

Parameter	Description
`<DOMAIN-NAME>`	Specifies the domain names for DNS queries.
`lifetime <TIME>`	Specifies lifetime in seconds. Range: 4-4294967295 seconds. Default: 1800 seconds.

Usage

- DNSSL contains the domain names of DNS suffixes or IPv6 hosts to append to short, unqualified domain names for DNS queries.
- Multiple DNS domain names can be added to the DNSSL by using the command repeatedly.
- A maximum of eight server addresses are allowed.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra dns search-list test.com lifetime 500
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra dns server

```
ipv6 nd ra dns server <IPV6-ADDR>  [lifetime <TIME>]
no ipv6 nd ra dns server <IPV6-ADDR>
```

Description

Configures the IPv6 address of a preferred Recursive DNS Server (RDNSS) to be included in Router Advertisements (RAs) transmitted on the interface.

The **no** form of this command removes the configured DNS server from the RAs transmitted on the interface.

Parameter	Description
<IPV6-ADDR>	Specifies the RDNSS address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. You can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a hextet of four zeros to a single 0. For example, this address **2222:0000:3333:0000:0000:0000:4444:0055** becomes **2222:0:3333::4444:55**.
`lifetime` *<TIME>*	Specifies IPv6 DNS server lifetime in seconds. Range: 4-4294967295 seconds. Default: 1800 seconds.

Usage

- Including RDNSS information in RAs provides DNS server configuration for connected IPv6 hosts without requiring DHCPv6.
- Multiple servers can be configured on the interface by using the command repeatedly.
- A maximum of eight server addresses are allowed.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra dns server 2001::1 lifetime 400
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra lifetime

```
ipv6 nd ra lifetime <TIME>
no ipv6 nd ra lifetime [<TIME>]
```

Description

Configures the lifetime, in seconds, for the routing switch to be used as a default router by hosts on the current interface.

The **no** form of this command sets lifetime to the default of 1800 seconds.

Parameter	Description
<TIME>	Specifies lifetime in seconds of a default router. A setting of 0 for default router lifetime in an RA indicates that the routing switch is not a default router on the interface. Range: 0-9000 seconds. Default: 1800 seconds.

Usage

- A given host on an interface refreshes the default router lifetime for a specific router each time the host receives an RA from that router.
- A specific router ceases to be a default router candidate for a given host if the default router lifetime expires before the host is updated with a new RA from the router.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra lifetime 1200
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra managed-config-flag

```
ipv6 nd ra managed-config-flag
no ipv6 nd ra managed-config-flag
```

Description

Controls the M flag setting in RAs the router transmits on the current interface. Enable the M flag to indicate that hosts can obtain IP address through DHCPv6. The M flag is disabled by default.

The **no** form of this command turns off (disables) the M flag.

Usage

- Enabling the M flag directs hosts to acquire their IPv6 addressing for the current interface from a DHCPv6 server.
- When the M-bit is enabled, receiving hosts ignore the O flag setting, which is configured using the command **ipv6 nd ra other-config-flag**.
- When the M-bit is disabled (the default), receiving hosts expect to receive their IPv6 addresses from RA.

M flag	O flag	Description
0	0	Indicates that no information is available via DHCPv6.
0	1	Indicates that other configuration information is available via DHCPv6. Examples of such information are DNS-related information or information on other servers within the network.

M flag	O flag	Description
1	0	Indicates that addresses are available via Dynamic Host Configuration Protocol (DHCPv6).
1	1	If the M flag is set, the O flag is redundant and can be ignored because DHCPv6 will return all available configuration information.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra managed-config-flag
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra max-interval

```
ipv6 nd ra max-interval <TIME>
no ipv6 nd ra max-interval [<TIME>]
```

Description

Configures the maximum interval between transmissions of IPv6 RAs on the interface. The interval between RA transmissions on an interface is a random value that changes every time an RA is sent. The interval is calculated to be a value between the current max-interval and min-interval settings.

The **no** form of this command returns the setting to its default, provided the default value is less than the default lifetime value.

Parameter	Description
<TIME>	Specifies the maximum advertisement time in seconds. Range: 4-1800. Default: 600 seconds.

Usage

- This value has one setting per interface. The setting does not apply to RAs sent in response to a router solicitation received from another device.
- Attempting to set max-interval to a value that is not sufficiently larger than the current min-interval also results in an error message.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra max-interval 30
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra min-interval

```
ipv6 nd ra min-interval <TIME>
no ipv6 nd ra min-interval [<TIME>]
```

Description

Configures the minimum interval between transmissions of IPv6 RAs on the interface. The interval between RA transmissions on an interface is a random value that changes every time an RA is sent. The interval is calculated to be a value between the current max-interval and min-interval settings.

The **no** form of this command returns the setting to its default, provided the default value is less than the current max-interval setting.

Parameter	Description
<TIME>	Specifies a minimum advertisement time in seconds. Range: 3-1350. Default: 200 seconds.

Usage

- This value has one setting per interface and does not apply to RAs sent in response to a router solicitation received from another device.
- The min-interval must be less than the max-interval. Attempting to set min-interval to a higher value results in an error message.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra  min-interval 25
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra other-config-flag

```
ipv6 nd ra other-config-flag
no ipv6 nd ra other-config-flag
```

Description

Controls the O-bit in RAs the router transmits on the current interface; but is ignored unless the M-bit is disabled in RAs. Configure to set the O-bit in RA messages for host to obtain network parameters through DHCPv6. The other-config-flag is disabled by default.

For more information on configuring the M-bit, see **ipv6 nd ra managed-config-flag**.

The **no** form of this command turns off (disables) the setting for this command in RAs.

Usage

Enabling the O-bit while the M-bit is disabled directs hosts on the interface to acquire their other configuration information from DHCPv6. Examples of such information are DNS-related information or information on other servers within the network.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra other-config-flag
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra reachable-time

```
ipv6 nd ra reachable-time <TIME>
no ipv6 nd ra reachable-time [<TIME>]
```

Description

Sets the amount of time that the interface considers a device to be reachable after receiving a reachability confirmation from the device.

The **no** form of this command sets the reachable time to the default value of 0. (no limit).

Parameter	Description
<TIME>	Specifies the reachable time in milliseconds. Range: 1000-3600000. Default: 0 (no limit).

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra reachable-time 2000
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd ra retrans-timer

```
ipv6 nd ra retrans-timer <TIME>
no ipv6 nd ra retrans-timer [<TIME>]
```

Description

Configures the period (retransmit timer) between ND solicitations sent by a host for an unresolved destination, or between DAD neighbor solicitation requests. By default, hosts on the interface use their own locally configured NS-interval settings instead of using the value received in the RAs.

Increase this timer when neighbor solicitation retries or failures are occur, or in a "slow" (WAN) network.

The **no** form of this command sets the value to the default of 0.

Parameter	Description
<TIME>	Specifies the retransmit timer value in milliseconds. Range: 0 - 4294967295 milliseconds. Default: 0 (Use locally configured NS-interval).

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra retrans-timer 400
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd route

```
ipv6 nd route <IPV6-ADDR>/<PREFIX-LEN> [no-advertise | lifetime {<SECONDS> | infinite} |
preference {low | medium | high}]
no ipv6 nd route <IPV6-ADDR>/<PREFIX-LEN> [no-advertise | lifetime {<SECONDS> | infinite}
| preference {low | medium | high}]
```

Description

Configures the routing switch to include the routing information in the RAs transmitted on the interface. The routing switch includes the route information in the RA packets only if the configured routes are present in the routing table. After receiving the RA packets carrying the route information, the IPv6 host updates its routing table. The hosts lookup their routing table and selects the best possible route to forward packets.

The **no** form of this command removes the settings for including the routing information in the RA packets.

Parameter	Description
`<IPV6-ADDR>/<PREFIX-LEN>`	Specifies the IPv6 route prefix to advertise in RA. Format: X:X::X:X/M
`no-advertise`	Specifies to not advertise the route information.
`lifetime {<SECONDS> | infinite}`	Specifies the duration in seconds that the route is valid for the route determination. If this parameter is configured with **0**, the route becomes invalid. Default: **1800**. Range: **0**-4294967295.
`preference {low | medium | high}`	Specifies the preference for the hosts to choose the router associated with the route over other routers when multiple identical route prefixes from different routers are received. Default: **medium**

Examples

On the 6400 Switch Series, interface identification differs.

Configuring routing information on interface **1/1/1**.

```
switch(config)# int 1/1/1
switch(config-if)# ipv6 nd route 1::1/64 lifetime 200 preference high
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd router-preference

```
ipv6 nd router-preference {high | medium | low}
no ipv6 nd router-preference [high | medium | low]
```

Description

Specifies the value that is set in the Default Router Preference (DRP) field of Router Advertisements (RAs) that the switch sends from an interface. An interface with a DRP value of high will be preferred by other devices on the network over interfaces with an RA value of medium or low.

The **no** form of this command set the value to the default of medium.

Parameter	Description
`high`	Sets DRP to high.
`medium`	Sets DRP to medium. Default.
`low`	Sets DRP to low.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd router-preference high
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 nd suppress-ra

```
ipv6 nd suppress-ra [<SUPPRESS-OPTION>]
```

```
no ipv6 nd ra supress-ra [<SUPPRESS-OPTION>]
```

Description

Configures suppression of IPv6 Router Advertisement transmissions on an interface.

The **no** form of this command restores transmission of IPv6 Router Advertisement and options.

Parameter	Description
`suppress-ra [<SUPPRESS-OPTION>]`	Specifies suppressing RA transmissions. Entering suppress-ra without any options, suppresses all RA messages (default). Or you can enter one of the following options.
`dnssl`	Specifies suppressing DNSSL options in RA messages.
`mtu`	Specifies suppressing MTU options in RA messages.
`rdnss`	Specifies suppressing RDNSS options in RA messages.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd suppress-ra mtu dnssl rdnss
switch(config-if)# no ipv6 nd suppress-ra mtu dnssl rdnss
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

show ipv6 nd global traffic

```
show ipv6 nd global traffic [vsx-peer]
```

Description

Displays IPV6 Neighbor Discovery traffic details on a device.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show ipv6 nd global traffic
  ICMPv6 packet Statistics (sent/received)
    Total Messages                 :        18/0
    Error Messages                 :        0/0
    Destination Unreachables       :        0/0
    Time Exceeded                  :        0/0
    Parameter Problems             :        0/0
    Echo Request                   :        0/0
    Echo Replies                   :        0/0
    Redirects                      :        0/0
    Packet Too Big                 :        0/0
    Router Advertisements          :        4/0
    Router Solicitations           :        0/0
    Neighbor Advertisements        :        0/0
    Neighbor Solicitations         :        3/0
    Duplicate router RA received :          0/0
  ICMPv6 MLD Statistics (sent/received)
    V1 Queries :          0/0
    V2 Queries :          0/0
    V1 Reports :          0/0
    V2 Reports :          11/0
    V1 Leaves  :          0/0
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 nd interface

`show ipv6 nd interface [<IF-NAME> | all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Displays neighbor discovery information for an interface. If no options are specified, displays information for the default VRF.

Parameter	Description
<IF-NAME>	Displays information about the specified IPv6 enabled interface.
all-vrfs	Displays information about interfaces in all VRFs.
vrf *<VRF-NAME>*	Displays information about interfaces in a particular VRF. Or, if ***<VRF-NAME>*** is not specified, information for the default VRF is displayed.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for all VRFs:

```
switch# show ipv6 nd interface all-vrfs

List of IPv6 Interfaces for VRF default
Interface 1/1/1 is up
  Admin state is up
  IPv6 address:
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent:
      Next Router-Advertisement sent in:
  Router-Advertisement parameters:
      Periodic interval: 200 to 600 secs
      Router Preference: medium
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1800
      Send "Reachable Time" field: 0
      Send "Retrans Timer" field: 0
      Suppress RA: true
      Suppress MTU in RA: true
  ICMPv6 error message parameters:
      Send redirects: false
  ICMPv6 DAD parameters:
      Current DAD attempt: 1


List of IPv6 Interfaces for VRF red
Interface 1/1/2 is up
  Admin state is up
  IPv6 address:
    2001::1/64 [VALID]
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent:
      Next Router-Advertisement sent in:
```

```
  Router-Advertisement parameters:
      Periodic interval: 200 to 600 secs
      Router Preference: medium
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1800
      Send "Reachable Time" field: 0
      Send "Retrans Timer" field: 0
      Suppress RA: true
      Suppress MTU in RA: true
  ICMPv6 error message parameters:
      Send redirects: false
  ICMPv6 DAD parameters:
      Current DAD attempt: 1
```

```
switch# show ipv6 nd interface all-vrfs

List of IPv6 Interfaces for VRF default
Interface vlan2 is up
  Admin state is up
  IPv6 address:
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent:
      Next Router-Advertisement sent in:
  Router-Advertisement parameters:
      Periodic interval: 200 to 600 secs
      Router Preference: medium
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1800
      Send "Reachable Time" field: 0
      Send "Retrans Timer" field: 0
      Suppress RA: true
      Suppress MTU in RA: true
  ICMPv6 error message parameters:
      Send redirects: false
  ICMPv6 DAD parameters:
      Current DAD attempt: 1


List of IPv6 Interfaces for VRF red
Interface vlan3 is up
  Admin state is up
  IPv6 address:
    2001::1/64 [VALID]
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent:
      Next Router-Advertisement sent in:
  Router-Advertisement parameters:
      Periodic interval: 200 to 600 secs
      Router Preference: medium
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
```

```
        Send "Router Lifetime" field: 1800
        Send "Reachable Time" field: 0
        Send "Retrans Timer" field: 0
        Suppress RA: true
        Suppress MTU in RA: true
    ICMPv6 error message parameters:
        Send redirects: false
    ICMPv6 DAD parameters:
        Current DAD attempt: 1
```

Showing information for interface 1/1/1:

```
switch# show ipv6 nd interface 1/1/1
Interface 1/1/1 is up
  Admin state is up
  IPv6 address:
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent:
      Next Router-Advertisement sent in:
  Router-Advertisement parameters:
      Periodic interval: 200 to 600 secs
      Router Preference: high
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1800
      Send "Reachable Time" field: 0
      Send "Retrans Timer" field: 0
      Suppress RA: true
      Suppress MTU in RA: true
  ICMPv6 error message parameters:
      Send redirects: false
  ICMPv6 DAD parameters:
      Current DAD attempt: 1
```

```
switch# show ipv6 nd interface vlan 2
Interface vlan2 is up
  Admin state is up
  IPv6 address:
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent:
      Next Router-Advertisement sent in:
  Router-Advertisement parameters:
      Periodic interval: 200 to 600 secs
      Router Preference: high
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1800
      Send "Reachable Time" field: 0
      Send "Retrans Timer" field: 0
      Suppress RA: true
      Suppress MTU in RA: true
  ICMPv6 error message parameters:
      Send redirects: false
  ICMPv6 DAD parameters:
      Current DAD attempt: 1
```

Showing information for the default VRF:

```
switch# show ipv6 nd interface

List of IPv6 Interfaces for VRF default
Interface 1/1/1 is up
  Admin state is up
  IPv6 address:
      2001::1/64  [VALID]
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent: 6 Secs
      Next Router-Advertisement sent in: 7 Secs
  Router-Advertisement parameters:
      Periodic interval: 3 to 13 secs
      Router Preference: medium
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1900
      Send "Reachable Time" field: 0
      Send "Retrans Timer" field: 0
      Suppress RA: true
      Suppress MTU in RA: true
  ICMPv6 error message parameters:
      Send redirects: false
  ICMPv6 DAD parameters:
      Current DAD attempt: 1
```

```
switch# show ipv6 nd interface

List of IPv6 Interfaces for VRF default
Interface vlan2 is up
  Admin state is up
  IPv6 address:
      2001::1/64  [VALID]
  IPv6 link-local address: fe80::7272:cfff:fee7:a8b9/64 [VALID]
  ICMPv6 active timers:
      Last Router-Advertisement sent: 6 Secs
      Next Router-Advertisement sent in: 7 Secs
  Router-Advertisement parameters:
      Periodic interval: 3 to 13 secs
      Router Preference: medium
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1900
      Send "Reachable Time" field: 0
      Send "Retrans Timer" field: 0
      Suppress RA: true
      Suppress MTU in RA: true
  ICMPv6 error message parameters:
      Send redirects: false
  ICMPv6 DAD parameters:
      Current DAD attempt: 1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 nd interface prefix

```
show ipv6 nd interface prefix [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows IPv6 prefix information for all VRFs or a specific VRF. If no options are specified, shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows prefix information for all VRFs.
`vrf <VRF-NAME>`	Name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing prefix information for the default VRF:

```
switch# show ipv6 nd interface prefix

List of IPv6 Interfaces for VRF default
List of IPv6 Prefix advertised on 1/1/1
   Prefix : 4545::/65
   Enabled : Yes
   Validlife time : 2592000
   Preferred lifetime : 604800
   On-link : Yes
   Autonomous : Yes
```

```
switch# show ipv6 nd interface prefix

List of IPv6 Interfaces for VRF default
List of IPv6 Prefix advertised on vlan2
   Prefix : 4545::/65
   Enabled : Yes
   Validlife time : 2592000
   Preferred lifetime : 604800
   On-link : Yes
   Autonomous : Yes
```

Showing information for VRF red:

```
switch# show ipv6 nd interface prefix vrf red

List of IPv6 Interfaces for VRF red
List of IPv6 Prefix advertised on 1/1/2
   Prefix : 2001::/64
   Enabled : Yes
   Validlife time : 2592000
   Preferred lifetime : 604800
   On-link : Yes
   Autonomous : Yes
```

```
switch# show ipv6 nd interface prefix vrf red

List of IPv6 Interfaces for VRF red
List of IPv6 Prefix advertised on vlan3
   Prefix : 2001::/64
   Enabled : Yes
   Validlife time : 2592000
   Preferred lifetime : 604800
   On-link : Yes
   Autonomous : Yes
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 nd interface route

`show ipv6 nd interface route [all-vrfs | vrf <VRF-NAME>]`

Description

Displays route information of all interfaces in the default VRF.

Parameter	Description
`all-vrfs`	Displays information about interfaces in all VRFs.
`vrf <VRF-NAME>`	Displays information about interfaces in a particular VRF. Or, if **<VRF-NAME>** is not specified, displays information for the default VRF.

Examples

On the 6400 Switch Series, interface identification differs.

Showing routing information for interface **1/1/1** in the default VRF:

```
switch# show ipv6 nd interface route

List of IPv6 Interfaces for VRF default
List of IPv6 Routes advertised on 1/1/1
   Route : 1::/64
   Enabled : Yes
   Route lifetime : 200
   Route preference : high
```

Showing routing information for interface **1/1/1** in VRF red:

```
switch# show ipv6 nd interface route vrf red

List of IPv6 Interfaces for VRF red
List of IPv6 Routes advertised on 1/1/2
   Route : 2::/64
   Enabled : No
   Route lifetime : 1800
   Route preference : low
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 nd ra dns search-list

```
show ipv6 nd ra dns search-list [vsx-peer]
```

Description

Displays domain name information on all interfaces.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra dns search-list test.com
switch# show ipv6 nd ra dns search-list
Recursive DNS Search List on: 1
     Suppress DNS Search List: Yes
     DNS Search 1: test.com    lifetime  1800
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 nd ra dns server

```
show ipv6 nd ra dns server [vsx-peer]
```

Description

Displays DNS server information on all interfaces.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 nd ra dns server 2001::1
switch# show ipv6 nd ra dns server
Recursive DNS Server List on: 1
     Suppress DNS Server List: Yes
     DNS Server 1: 2001::1    lifetime 1800
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 60

IPv6 source lockdown commands

ipv6 source-binding

```
ipv6 source-binding <VLAN-ID> <IPV6-ADDR> <MAC-ADDR> <IFNAME>
no ipv6 source-binding <VLAN-ID> <IPV6-ADDR> <MAC-ADDR> <IFNAME>
```

Description

Adds static IPv6 client source binding information to the switch IPv6 binding database. Although DHCPv6 snooping is often used to dynamically populate the binding database, this command is available for manually adding entries to the switch IPv6 binding database.

Statically configured IPv6 binding information supersedes any dynamically collected binding information for the same client.

The no form of this command removes the specified binding that was statically configured with the **ipv6 source-binding** command. The no form has no effect on bindings that were dynamically configured with DHCPv6 snooping.

Parameter	Description
<VLAN-ID>	Specifies the ID of an existing VLAN on which the client is connected. Range: 1 to 4094.
<IPV6-ADDR>	Specifies the client IPv6 address.
<MAC-ADDR>	Specifies the client MAC address.
<IFNAME>	Specifies the interface on which the client is connected.

Examples

On the 6400 Switch Series, interface identification differs.

Adding a static IPv6 binding:

```
switch(config)# ipv6 source-binding 2 2000::2 00:12:11:44:55:12 1/1/28
```

Removing a IPv6 binding:

```
switch(config)# no ipv6 source-binding 2 2000::2 00:12:11:44:55:12 1/1/28
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ipv6 source-lockdown

```
ipv6 source-lockdown
no ipv6 source-lockdown
```

Description

Enables IPv6 source lockdown for all VLANs on the selected interface (port).

The no form of this command disables IPv6 source lockdown for the selected interface (port).

This configuration will disable flow tracking statistics collection.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling IPv6 source lockdown on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 source-lockdown
```

Enabling IPv6 source lockdown on interface lag112:

```
switch(config)# interface lag112
switch(config-if)# ipv6 source-lockdown
```

Disabling IPv6 source lockdown on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no ipv6 source-lockdown
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	Added information related to role based IPFIX.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 source-lockdown hardware retry

`ipv6 source-lockdown hardware retry <VLAN-ID> <IPV6-ADDR>`

Description

Retries the IPV6 source lockdown hardware programming for a client identified by VLAN and IPv6 address.

Parameter	Description
<VLAN-ID>	Specifies the ID of an existing VLAN on which the client is connected. Range: 1 to 4094.
<IPV6-ADDR>	Specifies the client IPv6 address.

Example

Configure IPv6 source lockdown hardware retry for the client on VLAN 1.

```
switch(config)# ipv6 source-lockdown hardware retry 1 2000::2
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ipv6 source-binding

```
show ipv6 source-binding [vsx-peer]
```

Description

Shows all IPv6 static source binding information irrespective of source lockdown configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing all IPv6 source binding information:

```
              switch# show ipv6 source-binding

PORT            VLAN       MAC-ADDRESS        HW-STATUS  FROM      IPv6-ADDRESS

--------------- ---------  -----------------  ---------  --------- -------------
1/1/1           1234        00:50:56:96:e4:cf  Yes/No     static    3000::1

1/1/1           1           00:50:56:96:04:4d  Yes/No     static    3000::2
1/1/24          1           00:01:01:00:00:01  Yes        static    1001::1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 source-lockdown

```
show ipv6 source-lockdown [binding [interface <IFNAME> | ip <IPV6-ADDR> | mac <MAC-ADDR>
| vlan <VLAN-ID>] | interface <IFNAME>] [vsx-peer]
```

Description

Shows summary or detailed IPv6 source lockdown information. When entered without parameters, summary status information for all interfaces (ports) in the binding database is shown.

Parameter	Description
`binding`	Specifies that detailed lockdown binding record information is to be displayed. The binding database record can be identified by any one of **interface** (port), **ip**, **mac**, or **vlan**.
`interface <IFNAME>`	Specifies the client interface (port). When entered without the **binding** parameter, the summary status information is displayed for the specified interface.
`ip <IPV6-ADDR>`	Specifies the client IPv6 address.
`mac <MAC-ADDR>`	Specifies the client MAC address.
`vlan <VLAN-ID>`	Specifies the ID of an existing VLAN on which the client is connected. Range: 1 to 4094.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the summary status information for all interfaces in the binding database:

```
switch# show ipv6 source-lockdown

  INTERFACE  LOCKDOWN  HW-STATUS
  ---------  --------  ---------
  1/1/1      Yes       Yes
  1/1/2      Yes       Yes
  lag112     Yes       Yes
```

Showing the summary status information for the specified interface in the binding database:

```
switch# show ipv6 source-lockdown interface 1/1/2

  INTERFACE  LOCKDOWN  HW-STATUS
  ---------  --------  ---------
  1/1/2      Yes       No
```

Showing the detailed binding record and related information for all interfaces in the binding database:

```
switch# show ipv6 source-lockdown binding

 Interface Name        : 1/1/1
 VLAN Id               : 1234
 MAC Address           : 00:50:56:96:e4:cf
 IP Address            : aaaa:bbbb:cccc:dddd:eeee:1234
 Time Remaining        : static
 Lockdown Status       : Yes
 Hardware Status       : Yes
 Hardware Error Reason : --

 Interface Name        : 1/1/2
 VLAN Id               : 1234
 MAC Address           : 00:50:56:96:04:4d
 IP Address            : 4000::1
 Time Remaining        : 3290 seconds
 Lockdown Status       : Yes
 Hardware Status       : No
 Hardware Error Reason : Resource unavailable

 Interface Name        : lag112
 VLAN Id               : 151
 MAC Address           : 00:50:56:96:d8:3d
 IP Address            : 1001::5
 Time Remaining        : 1200 seconds
 Lockdown Status       : No
 Hardware Status       : Yes
 Hardware Error Reason : --

 Interface Name        : 1/1/1
 VLAN Id               : 1234
 MAC Address           : 00:50:56:96:e4:cf
 IP Address            : aaaa:bbbb:cccc:dddd:eeee:1234
 Time Remaining        : static
 Lockdown Status       : Yes
 Hardware Status       : Yes
 Hardware Error Reason : --

 Interface Name        : 1/1/2
 VLAN Id               : 1234
 MAC Address           : 00:50:56:96:04:4d
 IP Address            : 4000::1
 Time Remaining        : 3290 seconds
 Lockdown Status       : Yes
 Hardware Status       : No
 Hardware Error Reason : Resource unavailable

 Interface Name        : lag112
 VLAN Id               : 151
 MAC Address           : 00:50:56:96:d8:3d
 IP Address            : 1001::5
 Time Remaining        : 1200 seconds
 Lockdown Status       : No
 Hardware Status       : Yes
 Hardware Error Reason : --
```

Showing the detailed binding record and related information for interface 1/1/2:

```
switch# show ipv6 source-lockdown binding interface 1/1/2

 Interface Name        : 1/1/2
 VLAN Id               : 1234
 MAC Address           : 00:50:56:96:04:4d
 IP Address            : 4000::1
 Time Remaining        : 3290 seconds
 Lockdown Status       : Yes
 Hardware Status       : No
 Hardware Error Reason : Resource unavailable
 Interface Name         : 1/1/2
 VLAN Id                : 1234
 MAC Address            : 00:50:56:96:04:4d
 IP Address             : 4000::1
 Time Remaining         : 3290 seconds
 Lockdown Status        : Yes
 Hardware Status        : No
 Hardware Error Reason : Resource unavailable
```

Showing the detailed binding record and related information for interface 1/1/2 (identified in this example command by the IP address):

```
switch# show ipv6 source-lockdown binding ip 4000::1

 Interface Name         : 1/1/2
 VLAN Id                : 1234
 MAC Address            : 00:50:56:96:04:4d
 IP Address             : 4000::1
 Time Remaining         : 515 seconds
 Lockdown Status        : No
 Hardware Status        : Yes
 Hardware Error Reason : --
```

Showing the detailed binding record and related information for interface 1/1/1 (identified in this example command by the MAC address):

```
switch# show ipv6 source-lockdown binding mac 00:50:56:96:e4:cf

 Interface Name         : 1/1/1
 VLAN Id                : 1234
 MAC Address            : 00:50:56:96:e4:cf
 IP Address             : aaaa:bbbb:cccc:dddd:eeee:1234
 Time Remaining         : static
 Lockdown Status        : Yes
 Hardware Status        : Yes
 Hardware Error Reason : --
```

Showing the detailed binding record and related information for interface lag112 (identified in this example command by the VLAN):

```
switch# show ipv6 source-lockdown binding vlan 151

 Interface Name         : lag112
 VLAN Id                : 151
 MAC Address            : 00:50:56:96:d8:3d
 IP Address             : 1001::5
 Time Remaining         : 1200 seconds
 Lockdown Status        : No
 Hardware Status        : Yes
 Hardware Error Reason : --
```

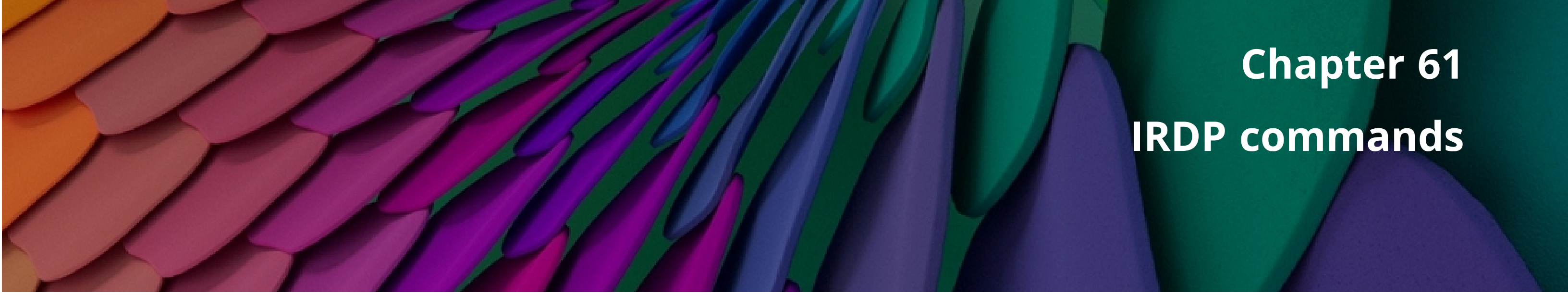
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 61
IRDP commands

diag-dump irdp basic

`diag-dump irdp basic`

Description

Displays diagnostic information for IRDP.

Example

On the 6400 Switch Series, interface identification differs.

```
switch# diag-dump irdp basic
=========================================================================
[Start] Feature irdp Time : Thu Jun  8 09:50:28 2017

=========================================================================
-------------------------------------------------------------------------
[Start] Daemon hpe-rdiscd
-------------------------------------------------------------------------
Interface: 1/1/1 (state : Up)
rdisc ipv4 (enabled: 0, max:600, min:450, hold:1800, pref:0, isBcast:0)
Router IPs - 192.168.1.2,
Interface: 1/1/2 (state : Up)
rdisc ipv4 (enabled: 0, max:600, min:450, hold:1800, pref:0, isBcast:0)
Router IPs - 192.168.2.2,

-------------------------------------------------------------------------
[End] Daemon hpe-rdiscd
-------------------------------------------------------------------------
=========================================================================
[End] Feature irdp
=========================================================================
Diagnostic dump captured for feature irdp
```

```
switch# diag-dump irdp basic
=========================================================================
[Start] Feature irdp Time : Thu Jan  7 04:46:25 2021
=========================================================================
-------------------------------------------------------------------------
[Start] Daemon hpe-rdiscd
-------------------------------------------------------------------------
Interface: vlan2 (state : Down)
rdisc ipv4 (enabled: 1, max:600, min:450, hold:1800, pref:0, isBcast:0)
No advertisable IPv4 addresses on the interface
Interface: vlan1 (state : Down)
rdisc ipv4 (enabled: 0, max:600, min:450, hold:1800, pref:0, isBcast:0)
No advertisable IPv4 addresses on the interface

-------------------------------------------------------------------------
```

```
[End] Daemon hpe-rdiscd
-------------------------------------------------------------------------
=========================================================================
[End] Feature irdp
=========================================================================
Diagnostic-dump captured for feature irdp
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip irdp

```
ip irdp [broadcast | multicast]
no ip irdp
```

Description

Enables IRDP on an interface and specifies the packet type that is used to send advertisements. By default, the packet type is set to `multicast`. IRDP is only supported on layer 3 interfaces.

The **no** form of this command disables IRDP on an interface.

Parameter	Description
`broadcast`	Advertisements are sent as broadcast packets to IP address 255.255.255.255.
`multicast`	Advertisements are sent as multicast packets to the multicast group with IP address 24.0.0.1. Default.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling IRDP on interface 1/1/1 with packet type set to the default value (multicast).

```
switch(config)# interface 1/1/1
switch(config-if)# ip irdp
```

Enabling IRDP on interface 1/1/1 with packet type set to broadcast.

```
switch(config)# interface 1/1/1
switch(config-if)# ip irdp broadcast
```

Disabling IRDP.

```
switch(config)# interface 1/1/1
switch(config-if)# no ip irdp
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ip irdp holdtime

```
ip irdp holdtime <TIME>
no ip irdp holdtime <TIME>
```

Description

Specifies the maximum amount of time the host will consider an advertisement to be valid until a newer advertisement arrives. When a new advertisement arrives, hold time is reset. Hold time must be greater than or equal to the maximum advertisement interval. Therefore, if the hold time for an advertisement expires, the host can reasonably conclude that the router interface that sent the advertisement is no longer available. The default hold time is three times the maximum advertisement interval.

The **no** form of this command removes the specified maximum amount of time the host will consider an advertisement to be valid until a newer advertisement arrives and update it to the default value.

Parameter	Description
<TIME>	Specifies the lifetime of router advertisements sent from this interface. Range: 4 to 9000 seconds. Default: 1800 seconds.

Example

On the 6400 Switch Series, interface identification differs.

Setting the hold time for interface 1/1/1 to 5000 seconds:

```
switch(config)# interface 1/1/1
switch(config-if)# ip irdp holdtime 5000
```

Removing the the hold time for interface 1/1/1 to 5000 seconds:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip irdp holdtime 5000
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ip irdp maxadvertinterval

```
ip irdp maxadvertinterval <TIME>
no ip irdp maxadvertinterval <TIME>
```

Description

Specifies the maximum router advertisement interval.

The **no** form of this command removes the specified maximum router advertisement interval and reverts to the default value.

Parameter	Description
<TIME>	Specifies the maximum time allowed between the sending of unsolicited router advertisements. Range: 4 to 1800 seconds. Default: 600 seconds.

Example

On the 6400 Switch Series, interface identification differs.

Setting the advertisement interval for interface 1/1/1 to 30 seconds:

```
switch(config)# interface 1/1/1
switch(config-if)# ip irdp maxadvertinterval 30
```

Removing the advertisement interval for interface 1/1/1 to 30 seconds:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip irdp maxadvertinterval 30
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ip irdp minadvertinterval

```
ip irdp minadvertinterval <TIME>
no ip irdp minadvertinterval <TIME>
```

Description

Specifies the minimum amount of time the switch waits between sending router advertisements. By default, this value is automatically set by the switch to be 75% of the value configured for maximum router advertisement interval. Use this command to override the automatically configured value.

The **no** form of this command removes the specified minimum amount of time the switch waits between sending router advertisements and reverts to the default value.

Parameter	Description
<TIME>	Specifies the minimum time allowed between the sending of unsolicited router advertisements. Range: 3 to 1800 seconds. Default: 450 seconds (75% of the default value for maximum router advertisement interval).

Example

On the 6400 Switch Series, interface identification differs.

Setting the minimum advertisement interval for interface 1/1/1 to 25 seconds:

```
switch(config)# interface 1/1/1
switch(config-if)# ip irdp minadvertinterval 25
```

Removing the minimum advertisement interval for interface 1/1/1 to 25 seconds:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip irdp minadvertinterval 25
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ip irdp preference

```
ip irdp preference <LEVEL>
no ip irdp preference <LEVEL>
```

Description

Specifies the IRDP preference level. If a host receives multiple router advertisement messages from different routers, the host selects the router that sent the message with the highest preference as the default gateway.

The **no** form of this command removes the specified IRDP preference level and reverts to the default value.

Parameter	Description
<LEVEL>	Specifies the IRDP preference level. Range: -2147483648 to 2147483647. Default: 0.

Example

On the 6400 Switch Series, interface identification differs.

Setting the IRDP preference level for interface 1/1/1 to 25.

```
switch(config)# interface 1/1/1
switch(config-if)# ip irdp preference 25
```

Removing the IRDP preference level for interface 1/1/1 to 25.

```
switch(config)# interface 1/1/1
switch(config-if)# no ip irdp preference 25
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

show ip irdp

`show ip irdp [vsx-peer]`

Description

Displays IRDP configuration settings.

Parameter	Description
`<location>`	Specifies one of these values: ■ *`<FQDN>`*: a fully qualified domain name. ■ *`<IPV4>`*: an IPv4 address. ■ *`<IPV6>`*: an IPv6 address.

`vsx-peer`
Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

```
switch# show ip irdp

ICMP Router Discovery Protocol

 Interface Status   Advertising Minimum  Maximum  Holdtime Preference
                    Address     Interval Interval
 --------- -------- ----------- -------- -------- -------- -----------
 1/1/1     Enabled  multicast   6        8        10       10
 1/1/2     Disabled multicast   450      600      1800     0
 1/1/3     Enabled  broadcast   450      600      1800     115
```

```
switch# sh ip irdp
```

```
ICMP Router Discovery Protocol

Interface        Status   Advertising Minimum  Maximum  Holdtime Preference
                          Address     Interval Interval
---------------- -------- ----------- -------- -------- -------- -----------
vlan1            Disabled multicast   450      600      1800     0
bridge_normal    Disabled multicast   450      600      1800     0
```

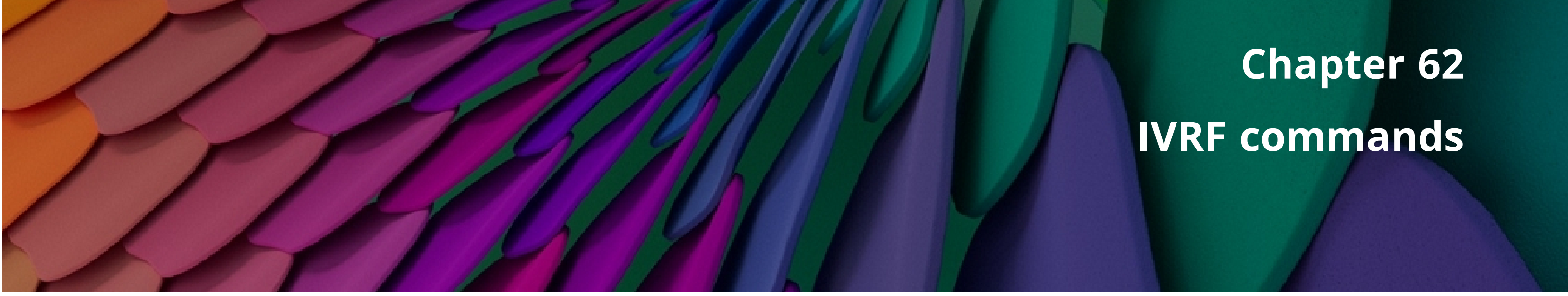
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 62
IVRF commands

address-family

```
address-family [<AFI> | <SAFI>] [ip | ipv6] [unicast]
[no] address-family <AFI> | <SAFI>
```

Description

Initializes the appropriate address-family and enters address-family configuration mode for IPv4 or IPv6. The unicast option is available to configure the subaddress family identifier.

The **no** form of the command removes the association of the specified address-family. The address-family specific routes that are leaked from this VRF will be withdrawn.

Parameter	Description
`AFI`	Required: Specifies address family identifier.
`SAFI`	Required: Specifies subaddress family identifier.
`ip`	Optional: IPv4 address family
`ipv6`	Optional: IPv6 address family
`unicast`	The subaddress family identifier. When the **unicast** option is used, the command context changes to **config-vrf-af-ipv4-uc**.

Examples

Address family command for IPv4 unicast:

```
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf)#no address-family ipv4 unicast
```

Address family command for IPv6 unicast:

```
switch(config-vrf)# address-family ipv6 unicast
switch(config-vrf)#no address-family ipv6 unicast
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	The **ipv4** keyword is deprecated and replaced with **ip**.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vrf`	Administrators or local user group members with execution rights for this command.

ip|ipv6 vrf

```
[ip|ipv6] route <PREFIX> <SRC-VRF-LOCAL-IFACE><SRC-VRF-NEXTHOP-IP> vrf <DST-VRF-NAME>
no [ip|ipv6] route <PREFIX> <SRC-VRF-LOCAL-IFACE><SRC-VRF-NEXTHOP-IP> vrf <DST-VRF-NAME>
```

Description

The IP/IPv6 route command sets the subnet mask, the reachable network interface, the next-hop IP for the reachable network, and the VRF route leak destination.

Parameter	Description
<PREFIX>	The subnet mask (prefix of the network).
<SRC-VRF-LOCAL-IFACE>	The interface which is reachable by the network.
<SRC-VRF-NEXTHOP-IP>	The next-hop IP for the reachable network.
<DST-VRF-NAME>	The VRF route leak destination.

Examples

Using the command, leak the named route Blue VRF, using prefix 100.0.0.0/24 which is reachable by the next-hop IP 20.0.0.1 on the interface 1/1/1 from VRF Red:

```
switch(config)# ip route 100.0.0.0/24 1/1/1 20.0.0.1 vrf blue
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ipv6 route source interface

```
ipv6 route <IPv6 ADDR/MEMBER><IPv6 ADDR> source  <INTERFACE>
 [<DISTANCE> | <VRF INSTANCE-NAME>]
no ipv6 route
```

Description

Creates a route leak between the source VRF and destination VRF. Using the static method, the route must first be added to the destination VRF. The route is added to the local interface of the source VRF with a next-hop interface. The existing IPv6 route command takes the source interface only when next-hop IP is link-local. To support VRF route leaking for global IPv6 unicast addresses, the command takes next-hop interface information along with next-hop IP regardless of next-hop IP is link-local or not.

- Users must provide both the next-hop IP and the interface information to leak the global unicast IPv6 network routes (route that is not directly reachable).
- The next-hop IP information is not required to leak connected global unicast IPv6 routes (route that is directly reachable).

The **no** form of command deletes the static VRF leaked route.

Parameter	Description
`<IPv6 ADDR/MEMBER>`	Required: IPv6 IP-Address route destination.
`<IPv6 ADDR>`	Required: IPv6 route destination
`<INTERFACE>`	Required: The outgoing interface. Use the format `member/slot/port` (for example, `1/3/1`).
`<DISTANCE>`	Optional: administrative distance of static route
`<VRF INSTANCE-NAME>`	Optional: VRF instance

Options

```
nullroute
```

Discard packets to the destined route silently.

```
reject
```

Discard packets to the destined route and return ICMP error to the sender.

Examples

Configures a route leak between the source VRF and destination VRF:

```
switch(config)# show runn
Current configuration:
!
```

```
vrf blue
      vrf green
vrf red
      !

vlan 1
               interface 1/1/1
               no shutdown
                      vrf attach red
        ip address 2000::1/64
                      interface 1/1/2
                      no shutdown
                      vrf attach green
               ip address 3000::1/64
               interface 1/1/3
                      no shutdown
               vrf attach blue
               ip address 4000::1/64


      switch(config)# ipv6 route 5000::0/64 3000::2 source 1/1/2 vrf red
switch(config)# ipv6 route 6000::0/64 3000::3 source 1/1/2 vrf blue


      switch(config)# show runn
Current configuration:
!
vrf blue
      vrf green
vrf red
      !

vlan 1
               interface 1/1/1
               no shutdown
                      vrf attach red
               ip address 2000::1/64
                      interface 1/1/2
                      no shutdown
                      vrf attach green
               ip address 3000::1/64
               interface 1/1/3
                      no shutdown
               vrf attach blue
        ip address 4000::1/64

        ipv6 route 5000::0/64 3000::2 source 1/1/2 vrf red
  ipv6 route 6000::0/64 3000::3 source 1/1/2 vrf blue

              switch(config)# no ipv6 route 5000::0/64 3000::2 source 1/1/2 vrf red
               switch(config)# no ipv6 route 6000::0/64 3000::3 source 1/1/2 vrf blue

      switch(config)# show runn
Current configuration:
!
      vrf blue
      vrf green
vrf red
      !

      vlan 1
                              interface 1/1/1
```

```
                no shutdown
vrf attach red
                ip address 2000::1/64
        interface 1/1/2
        no shutdown
         vrf attach green
  ip address 3000::1/64
         interface 1/1/3
        no shutdown
        vrf attach blue
        ip address 4000::1/64
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.10	Inclusive language update.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ip route interface

```
ip route <IPv4 ADDR/MEMBER> interface <IPv4 ADDR>
 [<DISTANCE> | <VRF INSTANCE-NAME>]
no ip route
```

Description

Creates a route leak between the SRC-VRF and DST-VRF. Using the static method, the route must first be added to the destination VRF. The route is added to the local interface of the source VRF with a next-hop interface. The existing IP route command can then take either the next-hop IP or the next-hop interface.

- **INTERFACE** refers to the outgoing interface in an m/s/p format
- Users must provide both the next-hop IP and the interface information to leak network routes.
- The next-hop IP information is not required to leak connected routes.

The `[no]` form of command deletes the static VRF leaked route.

Parameter	Description
<IPv4 ADDR/MEMBER>	Required: IPv4 IP-Address route destination.

Parameter	Description
<IPv4 ADDR>	Required: IPv4 route destination
<DISTANCE>	Optional: administrative distance of static route
<VRF INSTANCE-NAME>	Optional: VRF instance

Options

nullroute

Discard packets to the destined route silently.

reject

Discard packets to the destined route and return ICMP error to the sender.

Example

Configures a route leak between the SRC-VRF and DST-VRF:

```
switch(config)# show runn
Current configuration:
!
vrf blue
      vrf green
vrf red
      !

vlan 1
       interface 1/1/1
       no shutdown
              vrf attach red
       ip address 10.0.0.1/24
              interface 1/1/2
              no shutdown
              vrf attach green
       ip address 20.0.0.1/24
       interface 1/1/3
              no shutdown
       vrf attach blue
       ip address 40.0.0.1/24

      switch(config)# ip route A.B.C.D/M IPv4 route destination
      switch(config)# ip route A.B.C.D/M IPv4 route destination
      switch(config)# ip route 30.0.0.0/24 A.B.C.D Nexthop IPv4 address
      switch(config)# ip route 30.0.0.0/24 1/1/2 A.B.C.D Nexthop IPv4 address
      switch(config)# ip route 30.0.0.0/24 20.0.0.2 vrf green
      switch(config)# ip route 30.0.0.0/24 1/1/2 20.0.0.2 vrf red
      switch(config)# ip route 50.0.0.0/24 1/1/2 20.0.0.2 vrf blue
      switch(config)# ip route 50.0.0.0/24 20.0.0.2 vrf green
      switch(config)# ip route 60.0.0.0/24 1/1/2 vrf red

      switch(config)# show runn
Current configuration:
!
vrf blue
      vrf green
vrf red
      !

vlan 1
```

```
       interface 1/1/1
       no shutdown
              vrf attach red
       ip address 10.0.0.1/24
              interface 1/1/2
              no shutdown
              vrf attach green
       ip address 20.0.0.1/24
       interface 1/1/3
              no shutdown
       vrf attach blue
       ip address 40.0.0.1/24
       ip route 30.0.0.0/24 1/1/2 20.0.0.2 vrf red
       ip route 50.0.0.0/24 1/1/2 20.0.0.3 vrf blue
       ip route 60.0.0.0/24 1/1/2 vrf red


      switch(config)# no ip route 30.0.0.0/24 1/1/2 20.0.0.2 vrf red
      switch(config)# no ip route 50.0.0.0/24 1/1/2 20.0.0.3 vrf blue
      switch(config)# no ip route 60.0.0.0/24 1/1/2 vrf red

      switch(config)# show runn
Current configuration:
!
      vrf blue
      vrf green
vrf red
      !

      vlan 1
      interface 1/1/1
      no shutdown
      vrf attach red
      ip address 10.0.0.1/24
      interface 1/1/2
      no shutdown
      vrf attach green
      ip address 20.0.0.1/24
      interface 1/1/3
      no shutdown
      vrf attach blue
      ip address 40.0.0.1/24
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.10	Inclusive language update.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

rd

```
rd <AS-NUMBER:NN>
no rd <AS-NUMBER:NN>
```

Description

Configures VRF table with specified route-distinguisher value. An RD ensures uniqueness of a route between multiple VRFs.

The **no** form of the command will delete RD from a specified VRF table. The VRF instance goes down when RD is deleted. All routes that are exported or leaked from the deleted VRF will be withdrawn.

Parameter	Description
<AS-NUMBER:NN>	Required: Enter an AS number and an arbitrary number.

Examples

Configures VRF for RD with an AS number 100:1.

```
switch(config-vrf)# rd 100:1
```

Deletes the RD from the specified VRF.

```
switch(config-vrf)# no rd
```

Deletes the RD and AS number from the specified VRF.

```
switch(config-vrf)# no rd 100:1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vrf`	Administrators or local user group members with execution rights for this command.

redistribute

```
redistribute <protocol> [route-map <route-map-name>]
[no] redistribute <protocol> [route-map <route-map-name>]
```

Description

Specifies the protocol routes to redistribute to BGP VRF context. Any routes existing in the BGP VRF context are leaked as a VPNv4 or VPNv6 prefixes to other VRFs based on BGP route-targets.

The **no** form of this command removes the protocol.

Parameter	Description
`redistribute`	Required: redistributes routes from another routing protocol.
`connected`	Optional: redistribute directly attached networks.
`ospfv3`	Optional: redistributes OSPFv3 routes.
`static`	Optional: redistributes static routes.
`route-map`	Optional: applies route map policy for redistribution.

Examples

The following is an example of redistributing OSPFv2 routes to a BGP **`vrf cust_a`** instance by creating a router BGP instance for **cust_a**.

1. Creating the router BGP instance for **cust_a**.

```
switch(config)# router bgp 1
switch(config-router) # vrf cust_a
```

2. Redistributing the router to BGP.

```
switch(config-router-bgp)# redistribute ospf
```

The following is an example of redistributing OSPFv3 routes to a BGP `vrf cust_a` instance by creating a router BGP instance for `cust_a`.

1. Creating the router BGP instance for **`cust_a`**

```
switch(config)# router bgp 100
switch(config-router)# vrf cust_a
```

2. Configuring the address family IPv6 unicast to the router

```
switch(config-router-bgp)# address-family ipv6 unicast
```

3. Redistributing the router to OSPFv3

```
switch(config-router-ipv6-uc)# redistribute ospfv3
```

4. Redistributing the router configured with `ipv6-af-us` to OSPFv3

```
switch(config-router-bgp-vrf-ipv6-af-uc)# redistribute ospfv3
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

route-target

```
route-target [import | export | both] <AS-NUMBER:NN>
no route-target [import | export | both] <AS-NUMBER:NN>
```

Description

BGP route targets are extended BGP communities that identify the VPNv4 or VPNv6 routes that are associated with a VRF. This command specifies the route targets used on the import or export of the routes to other VRFs. Multiple route targets can be associated with a VRF.

The **no** form of the command removes the association.

Parameter	Description
`import`	Specifies the RTs imported to the VRF. Import or export or both required Literal Specifies the route-target type.
`export`	Specifies the RT on VPNv4 or VPNv6 prefixes that are leaked to other VRFs.

Parameter	Description
both	Specifies the RT for both export and import types.
<AS-NUMBER:NN>	Specifies an AS number and an arbitrary number for the RT value.

Examples

Configuring route targets for several VRFs.

```
switch(config)# vrf default
switch(config-vrf)# rd 192.168.2.1:0
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-ipv4-af-uc)# route-target export 65001:0
switch(config-vrf-ipv4-af-uc)# route-target import 65001:1
switch(config-vrf-ipv4-af-uc)# route-target import 65001:2
switch(config-vrf-ipv4-af-uc)# exit-address-family
switch(config-vrf)# exit
switch(config)# vrf VRF1
switch(config-vrf)# rd 192.168.2.1:1
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-ipv4-af-uc)# route-target export 65001:1
switch(config-vrf-ipv4-af-uc)# route-target import 65001:0
switch(config-vrf-ipv4-af-uc)# exit-address-family
switch(config-vrf)# exit
switch(config)# vrf VRF2
switch(config-vrf)# rd 192.168.2.1:2
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-ipv4-af-uc)# route-target export 65001:2
switch(config-vrf-ipv4-af-uc)# route-target import 65001:0
switch(config-vrf-ipv4-af-uc)# exit-address-family
switch(config-vrf)# exit
```

Configuring the route target for export. Removing the configuration for export.

```
switch(config-vrf-ipv4-af-uc)# route-target export 100:1
switch(config-vrf-ipv4-af-uc)# no route-target export 100:1
```

Configuring the route target for import. Removing the configuration for import.

```
switch(config-vrf-ipv4-af-uc)# route-target import 100:2
switch(config-vrf-ipv4-af-uc)# no route-target import 100:2
```

Configuring the route target for both import and export. Removing the configuration for import and export.

```
switch(config-vrf-ipv4-af-uc)# route-target both 100:3
switch(config-vrf-ipv4-af-uc)# no route-target both 100:3
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

route-target export

```
route-target export route-map <ROUTE-MAP-NAME>
no route-target export route-map <ROUTE-MAP-NAME>
```

Description

This command specifies the route-map to be used while exporting routes to VRF. Route target export route-map is configured to filter the routes those are leaked to VRF.

The **no** form of the command removes the specification.

Parameter	Description
route-map	Specifies route-map policy for export.
<ROUTE-MAP-NAME>	Specifies route-map policy name

VPNv4 SAFI is not supported.

Examples

Configuring route-map for route target export in IPv4:

```
switch(config)# vrf cust_a
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-ipv4-af-uc)# route-target export route-map rmap
```

Removing the configuration for export in IPv4:

```
switch(config)# vrf cust_a
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-ipv4-af-uc)# no route-target export route-map rmap
```

Configuring route-map for route target export in IPv6:

```
switch(config)# vrf cust_a
switch(config-vrf)# address-family ipv6 unicast
switch(config-vrf-ipv6-af-uc)# route-target export route-map rmap
```

Removing the configuration for export in IPv6:

```
switch(config)# vrf cust_a
switch(config-vrf)# address-family ipv6 unicast
switch(config-vrf-ipv6-af-uc)# no route-target export route-map rmap
```

Match prefix-list and set metric is only supported for route-target export route-map:

```
route-map rmap permit seq 1
       match ip address prefix-list prefx
       set metric 400
ip prefix-list seq 1 permit 14.1.1.0/24
```

Applies to both IPv4 and IPv6 address family only.

Only one route-target export route-map per VRF can be configured.

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.12.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-vrf`	Administrators or local user group members with execution rights for this command.

router bgp

```
router bgp <AS-NUMBER>
no router bgp <AS-NUMBER>
```

Description

This command configures the BGP instance on the router, configures the AS (Autonomous System) the router belongs to, and enters into the BGP router configuration mode. Only a single BGP AS number can be assigned for the entire system.

The **no** form of the command deletes the BGP instance from the router.

Parameter	Description
AS-NUMBER	Specifies a 4-byte AS number in the range 1-4294967295 in integer format or from 0.1-65535.65535 in dotted format.

Examples

Configuring the BGP instance with the AS number:

Deleting BGP configurations:

```
switch(config)# no router bgp 100
This will delete all BGP configurations on this device.
Continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

router bgp vrf

```
router bgp <AS-NUMBER> [vrf <VRF-NAME>]
[no] router bgp <AS-NUMBER> [vrf <VRF-NAME>]
```

Description

This command configures VRF for the BGP instance.

The **no** form of this command removes the configuration.

Parameter	Description
AS-NUMBER	Specifies a 4-byte AS number in the range 1-4294967295 in integer format or from 0.1-65535.65535 in dotted format.
<VRF-NAME>	String VRF name for the VRF.

Usage

- Use the command **vrf *vrf-name*** within the router BGP context.
- **address-family {ipv4 | ipv6}** nodes are only supported within the VRF context.
- **address-family {ipv4 | ipv6}** nodes are required to redistribute the OSPF static/connected IPv4 or IPv6 routes.

Examples

Configure the VRF for customer A, on the BGP instance 100:

```
switch(config)# router bgp 100
switch(config)# vrf cust_a
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show bgp vpn unicast

```
show bgp [vrf <VRF-NAME>][{ipv4 unicast | ipv6 unicast| ipv4 unicast| all unicast}] [vsx-peer]
```

Description

Shows the BGP-VPN per VRF routes with additional route information like RD and extended community route targets.

Displays the BGP neighbor information for the specified VRF.

By default the default_vrf BGP instance information is displayed if the VRF is not specified.

Parameter	Description
`unicast`	Selects the subaddress family identifier
`all`	Displays VPNv4 address family routes for all VRFs
`vrf`	Displays VPNv4 address-family routes for specified VRF
`vpn-addr-family`	Required: Literal Select the VPNv4 or VPNv6 address family
`vrf-name`	Required: Literal or string. Specify **all** or **vrf-name**.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Required use of *vpn-addr-family*:

```
switch# show bgp <vpn-addr-family> unicast {all | [vrf <vrf-name> | A.B.C.D/M}
```

Show BGP VRF ipv4 unicast routes for vrf-name

```
switch# show bgp vrf Red ipv4 unicast
       Status codes: s suppressed, d damped, h history, * valid, > best, = multipath
       i internal, e external, S Stale, R Removed
       Origin codes: i - IGP, e - EGP, ? - incomplete

  VRF: Red
  Local Router-ID 172.16.3.1

  Network           Nexthop       Metric  LocPrf  Weight Path
  Route Distinguisher: 65000:1
  *> 172.16.0.0/24  0.0.0.0       0       100     32768      ?
  *> 172.16.1.0/24  0.0.0.0       0       100     32768      ?
  *> 172.16.2.0/24  172.16.0.2    0       100     32768      ?
  *> 172.16.3.0/24  172.16.0.3    0       100     32768      ?

  Total number of entries 4
```

```
switch# show bgp vrf Green ipv4 unicast
       Status codes: s suppressed, d damped, h history, * valid, > best, = multipath
       i internal, e external, S Stale, R Removed
       Origin codes: i - IGP, e - EGP, ? - incomplete

               VRF: Green
  Local Router-ID 172.17.2.1

  Network           Nexthop       Metric  LocPrf  Weight Path
  Route Distinguisher: 65000:2
  *> 172.17.0.0/24  0.0.0.0       0       100     32768      ?
  *> 172.17.1.0/30  0.0.0.0       0       100     32768      ?
  *> 172.17.2.0/24  172.17.0.2    0       100     32768      ?

  Total number of entries 3
```

```
switch# show bgp vrf Blue ipv4 unicast
       Status codes: s suppressed, d damped, h history, * valid, > best, = multipath
       i internal, e external, S Stale, R Removed
       Origin codes: i - IGP, e - EGP, ? - incomplete

  VRF: Blue
  Local Router-ID 172.18.3.1

               Network           Nexthop       Metric  LocPrf  Weight Path
  Route Distinguisher: 65000:3
  *> 172.18.0.0/24  0.0.0.0       0       100     32768      ?
  *> 172.18.1.0/30  0.0.0.0       0       100     32768      ?
  *> 172.18.3.0/24  172.18.0.3    0       100     32768      ?

  Total number of entries 3
```

```
switch# show bgp vrf Shared ipv4 unicast
       Status codes: s suppressed, d damped, h history, * valid, > best, = multipath
       i internal, e external, S Stale, R Removed
       Origin codes: i - IGP, e - EGP, ? - incomplete

  VRF: Shared
  Local Router-ID 192.168.99.1

               Network             Nexthop       Metric  LocPrf  Weight Path
  Route Distinguisher: 65000:99
  *> 192.168.99.0/24  0.0.0.0       0       100     32768      ?

  Total number of entries 1
```

Show BGP VRF ipv6 unicast routes for vrf-name:

```
switch# show bgp vrf Red ipv6 unicast
       Status codes: s suppressed, d damped, h history, * valid, > best, = multipath
       i internal, e external, S Stale, R Removed
       Origin codes: i - IGP, e - EGP, ? - incomplete

  VRF: Red
  Local Router-ID 172.16.3.1

  Network           Nexthop       Metric  LocPrf  Weight Path
  Route Distinguisher: 65000:1
  *  2001:100:1:1000:/56
         2001:100:1:1000::72a     0       0       200      ?
  *> 2001:100:1:1000::/56
           ::                     0       100     32768    ?
  *  2001:100:1:2000::/56
         ::FFFF:200.10.10.1 0     0       100     32768    ?

  Total number of entries 3
```

Show BGP VRF routes for all vrfs and all address-families:

```
switch# show bgp all-vrf all
       Status codes: s suppressed, d damped, h history, * valid, > best, = multipath
       i internal, e external, S Stale, R Removed
       Origin codes: i - IGP, e - EGP, ? - incomplete

  VRF: Blue
  Local Router-ID 172.18.3.1

  Address-family: IPv4 Unicast
               ----------------------------
  Network           Nexthop       Metric  LocPrf  Weight Path
  *> 172.18.0.0/24  0.0.0.0       0       100     32768    ?
  *> 172.18.1.0/30  0.0.0.0       0       100     32768    ?
  *> 172.18.3.0/24  172.18.0.3    0       100     32768    ?

  Total number of entries 3

  Address-family: IPv6 Unicast
               ----------------------------
  Network           Nexthop       Metric  LocPrf  Weight Path
```

```
Toatl number of entries 0

VRF: Green
Local Router-ID 172.17.2.1

Address-family: IPv4 Unicast
             ----------------------------
Network           Nexthop       Metric  LocPrf  Weight Path
*> 172.17.0.0/24  0.0.0.0       0       100     32768    ?
*> 172.17.1.0/30  0.0.0.0       0       100     32768    ?
*> 172.17.2.0/24  172.17.0.2    0       100     32768    ?

Total number of entries 3

Address-family: IPv6 Unicast
             ----------------------------
Network           Nexthop       Metric  LocPrf  Weight Path

Total number of entries 0

VRF: Red
Local Router-ID 172.16.3.1

Address-family: IPv4 Unicast
             ----------------------------
Network           Nexthop       Metric  LocPrf  Weight Path
*> 172.16.0.0/24  0.0.0.0       0       100     32768    ?
*> 172.16.1.0/24  0.0.0.0       0       100     32768    ?
*> 172.16.2.0/24  172.16.0.2    0       100     32768    ?
*> 172.16.3.0/24  172.16.0.3    0       100     32768    ?

Total number of entries 4

Address-family: IPv6 Unicast
             ----------------------------
Network           Nexthop       Metric  LocPrf  Weight Path
*  2001:100:1:1000::/56
       2001:100:1:1000::72a     0       0       200      ?
*> 2001:100:1:1000::/56
         ::                     0       100     32768    ?
*  2001:100:1:2000::/56
       ::FFFF:200.10.10.1 0     0       100     32768    ?

Total number of entries 3

VRF: Shared
Local Router-ID 192.168.99.1

Address-family: IPv4 Unicast
             ----------------------------
Network             Nexthop       Metric  LocPrf  Weight Path
*> 192.168.99.0/24  0.0.0.0       0       100     32768    ?

Total number of entries 1

Address-family: IPv6 Unicast
             ----------------------------
Network           Nexthop       Metric  LocPrf  Weight Path

Total number of entries 0
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show bgp info vrf

```
show bgp info vrf <vrf-name> [vsx-peer]
```

Description

Displays BGP route-targets information for specified VRF.

Parameter	Description
`info`	Display BGP RT information.
`vrf-name`	Required string VRF name for the vrf.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Show BGP VRF information.

```
switch# show bgp info vrf red
 VRF : red
        VRF RD : 100:1

        Address-family IPv4 unicast info
        Redistribution : ospf
        Export RT list : 100:1 100:2
        Import RT list : 100:3
```

```
       Address-family IPv6 unicast info
       Redistribution : connected
 Export RT list : 100:11 100:12
 Import RT list : 100:15
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip route vrf

`show ip route vrf <vrf-name> [vsx-peer]`

Description

Shows route information for specified VRF.

Parameter	Description
vrf-name	Required: string VRF name for the VRF.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show ip route vrf green

       Displaying ipv4 routes selected for forwarding
        '[x/y]' denotes [distance/metric]
               10.0.0.0/24, vrf green
                via 20.0.0.1[vrf red], [1/0], static
                30.0.0.0/24, vrf green
                via 1/1/2, [0/0], connected
   30.0.0.2/32, vrf green
                via 1/1/2, [0/0], local
                60.0.0.0/24, vrf green
                via 1/1/1[vrf red], [1/0], static
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 route vrf

`show ipv6 route vrf <VRF-NAME> [vsx-peer]`

Description

Shows the route information for specified VRF.

Parameter	Description
<VRF-NAME>	Required: String VRF name for the VRF.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Displaying ipv6 routes selected for forwarding:

```
switch# show ipv6 route vrf red
  '[x/y]' denotes [distance/metric]
                1000::/64, vrf red
                via 1/1/1[vrf green], [0/0], connected
                1000::1/128, vrf red
                via 1/1/1[vrf green], [0/0], local
                3005::/64, vrf red
                via 1000::2[vrf green], [2/0], static
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

vrf

```
vrf <VRF-NAME>
no vrf <VRF-NAME>
```

Description

Creates a VRF instance named <*VRF-NAME*> and then enters its context. Use **default** for <*VRF-NAME*> to enter the default VRF configure context.

Except for the default VRF, the **no** form of the command deletes the named VRF instance and any IP configuration for interfaces or SVI linked to default VRF. The default VRF cannot be deleted and a warning is given if attempted. To erase the Route-Distinguisher and Route-Targets, enter the default VRF context and delete them manually one by one.

Parameter	Description
<VRF-NAME>	Specifies the VRF name. Range: Up to 32 alphanumeric characters. The **mgmt** VRF cannot be used.

Examples

Creating the VRF named **cust_A** and then entering its context:

```
switch(config)# vrf cust_A
```

Entering the **default** VRF context:

```
switch(config)# vrf default
```

Deleting the VRF named **test**:

```
switch(config)# no vrf test
```

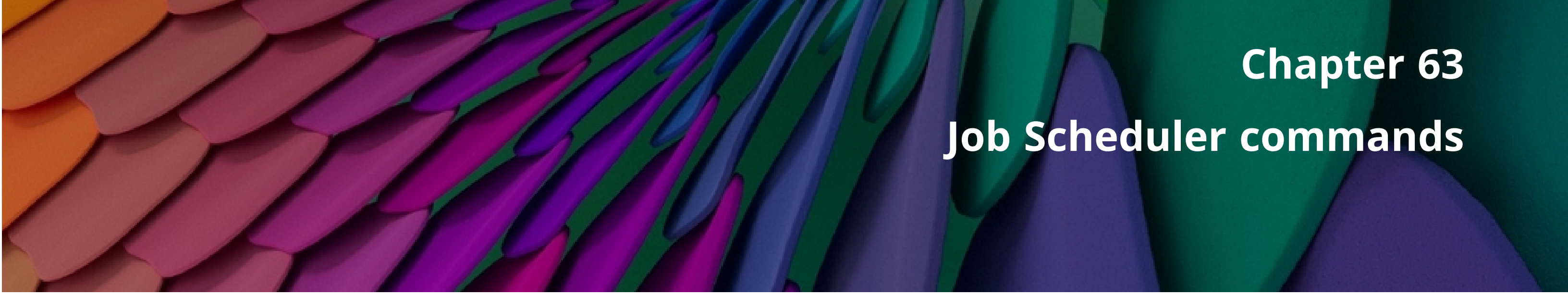
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.09	Added default VRF information.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.



Chapter 63

Job Scheduler commands

job

In the config context:

```
job <JOB-NAME>
no job [<JOB-NAME>]
```

Subcommands available In the job config context (`config-job`):

```
[no] enable
[no] desc <DESCRIPTION>
[no] [<SEQ-NUM>] [delay <DELAY>] cli <COMMAND>
resequence <START-SEQ-NUM> <INCREMENT>
```

Description

If **<*JOB-NAME*>** does not exist, this command creates a job and then enters its context.

The no form of this command deletes the specified job. If no job is specified, all jobs are deleted.

Deleting a job also removes it from any schedule that uses the job, preventing further attempts to execute the job.

If **<*JOB-NAME*>** exists, this command enters the **config-job-<*NAME*>** context for the specified job.

Parameter	Description
<JOB-NAME>	Specifies the job name. Range 1 to 64 characters (alphanumeric and "_" (underscore)

Subcommands

These subcommands are available within the **config-job-<*NAME*>** context for configuring the job:

`enable`

Enables the job (the default). **no enable** disables the job.

`[no] desc <DESCRIPTION>`

Specifies a user-defined job description. **no desc** removes the description. Range: 1 to 128 characters. For example:

```
switch(config-job-PTog1)# desc Toggle port 1/1/1
```

`[no] [<SEQ-NUM>] [delay <DELAY>] cli <COMMAND>`

Adds a CLI command to the job. The no form removes the command from the job. When executed, commands with simple (y/n) prompts (such as **boot system**) will be automatically confirmed with "y." Other commands requiring more complex user input (such as password change) cannot be used.

<SEQ-NUM> specifies the job CLI command sequence number to facilitate ordering of commands within a job. When omitted, a sequence number that is 10 greater the highest existing sequence number is auto-assigned. The first auto-assigned sequence number is 10. Range: 1 to 4294967295.

[delay <*DELAY*>] specifies the delay in seconds before this CLI command is executed. The cumulative delay for all commands in a job must be no more than 300 seconds. Range 1 to 300.

cli <*COMMAND*> specifies the CLI command to be executed. Range 1 to 4096 characters.

These commands must not be used in a job: **copy**, **repeat**, **show boot-history**, **show core-dump**, **show events**, **show job**, **show tech**, **sleep**, **terminal-monitor**.

For example, adding a command as line 18 to a job:

```
switch(config-job-PTog1)# 18 cli interface 1/1/1
```

resequence *<START-SEQ-NUM> <INCREMENT>*

Resequences the CLI command line sequence numbers. Both **<START-SEQ-NUM>** and **<INCREMENT>** default to 10. For example, resequencing the CLI command list to start at 10 with an increment of 5.

```
switch(config-job-PTog1)# resequence 10 5
switch(config-job-PTog1)# show job PTog1

Job Name : PTog1
...
    Job CLI commands
    ----------------
    10 cli config
    15 cli interface 1/1/1
    20 cli shutdown
...
```

Usage

- A maximum of 20 commands can be used in a job.
- To see the maximum number of jobs and job execution output preserved instances for your particular switch, use command **show capacities job**.
- Jobs must complete execution in under five minutes and are force-stopped after five minutes if they do not.

Examples

Creating a port toggle job named **PTog1**:

```
switch(config)# job PTog1
switch(config-job-PTog1)# desc Toggle port 1/1/1
switch(config-job-PTog1)# 10 cli config
switch(config-job-PTog1)# 20 cli interface 1/1/1
switch(config-job-PTog1)# 30 cli shutdown
switch(config-job-PTog1)# 40 delay 10 cli no shutdown
switch(config-job-PTog1)# 50 cli end
switch(config-job-PTog1)# exit
switch(config)#
```

Creating a job named **Reboot_sw1** that saves the running configuration and then reboots the switch:

```
switch(config)# job Reboot_Sw1
switch(config-job-Reboot_sw1)# desc Save config then reboot switch
switch(config-job-Reboot_Sw1)# 10 cli config
switch(config-job-Reboot_Sw1)# 20 cli write mem
switch(config-job-Reboot_Sw1)# 30 cli boot system
switch(config-job-Reboot_Sw1)# exit
switch(config)#
```

For more information on features that use this command, refer to the Job Scheduler Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority

All platforms	`config`
	`config-job-<NAME>`
		Administrators or local user group members with execution rights for this command.

schedule

In the config context:

```
schedule <SCHEDULE-NAME> [transient]
no schedule [<SCHEDULE-NAME>]
```

Subcommands available In the schedule config context (`config-schedule`):

```
[no] enable
[no] desc <DESCRIPTION>
[no] [<SEQ-NUM>] job <JOB-NAME>
resequence <START-SEQ-NUM> <INCREMENT>
[no] trigger on HH:MM {daily | weekly <1-7> | monthly <1-31>}
     [count <1-1000>] [start YYYY-MM-DD]
[no] trigger every {days <1-365> | hours <1-8760> | minutes <30-525600>}
     [count <1-1000> ] [start HH:MM [YYYY-MM-DD]]
[no] trigger at HH:MM [YYYY-MM-DD]
```

Description

If ***<SCHEDULE-NAME>*** does not exist, this command creates a job schedule and then enters its context.

The **no** form of this command deletes the specified schedule. If no schedule is specified, all schedules are deleted.

If ***<SCHEDULE-NAME>*** exists, this command enters the **config-schedule-*<NAME>*** context for the specified job schedule.

Parameter	Description
<SCHEDULE-NAME>	Specifies the schedule name. Range 1 to 64 characters (alphanumeric and "_" (underscore)).
[transient]	Causes the schedule to be cleared upon switch reboot. By default, schedules are maintained after switch reboots.

Subcommands

These subcommands are available within the config-schedule-*<NAME>* context for scheduling jobs and controlling the order in which the jobs are executed:

enable

Enables the schedule (the default). no enable disables the schedule.

[no] desc *<DESCRIPTION>*

Specifies a user-defined schedule description. no desc removes the description. Range: 1 to 128 characters. For example:

```
switch(config-schedule-Monthly)# desc Monthly schedule
```

[no] [*<SEQ-NUM>*] job *<JOB-NAME>*

Associates an existing job with this schedule. The no form removes the job from the schedule.

<JOB-NAME> specifies an existing job name. Range: 1 to 64 characters (alphanumeric and "_" (underscore)).

<SEQ-NUM> specifies the job name sequence number to facilitate ordering of jobs within a schedule. When omitted, a sequence number that is 10 greater the highest existing sequence number is auto-assigned. The first auto-assigned sequence number is 10.

For example, associating two jobs with the selected schedule:

```
switch(config-schedule-Monthly)# 10 job PTog1
switch(config-schedule-Monthly)# 20 job PTog2
```

resequence *<START-SEQ-NUM>* *<INCREMENT>*

Resequences the job name sequence numbers in the schedule. Both <START-SEQ-NUM> and <INCREMENT> default to 10. For example, resequencing the job list to start at 5 with an increment of 10.

```
switch(config-schedule-Monthly)# resequence 5 10
switch(config-schedule-Monthly)# show schedule Monthly

Schedule Name: Monthly
...
    Scheduled Jobs
    --------------
    5    : PTog1
    15   : PTog2
```

[no] trigger on HH:MM {daily | weekly <1-7> | monthly <1-31>}
[count <1-1000>] [start YYYY-MM-DD]

Sets the job to trigger at a specific time. The no form removes the trigger.

HH:MM selects the time using a 24-hour clock (switch local time). Range: 00:00 to 23:59.

daily selects daily.

weekly <1-7> selects specific days of week or days-of-week ranges (with comma or hyphen separators) using numeric day-of-week numbers with Sunday equal 1. For example: `1,3,5-7` for Sunday, Tuesday, Thursday, Friday, Saturday.

monthly <1-31> selects specific days of month or days of month ranges (with comma or hyphen separators) using numeric day-of-month numbers. For example: `5,14-21,25,31`. For months with fewer days than the specified day number, the last day of the month is selected.

count <1-1000> selects the number of times the job will be executed. When omitted, job execution triggering is indefinite.

start YYYY-MM-DD selects the schedule first trigger date. When omitted, today's date is used for times at least 5 minutes into the future, otherwise tomorrow is selected as the first trigger date.

For example, setting the schedule to trigger monthly on the 15th, at 11:45 PM, starting on August 15, with an execution limit of 200:

```
switch(config-schedule-M)# trigger on 23:45 monthly 15 count 200 start 2021-08-15
```

**[no] trigger every {days <1-365> | hours <1-8760> | minutes <30-525600>}
[count <1-1000>] [start HH:MM [YYYY-MM-DD]]**

Sets the job trigger to a specific periodic interval. The no form removes the trigger. By default, the schedule is activated within 5 minutes from the configuration time. If the start time is specified, then the job is executed beginning at the specified start time and thereafter at the specified interval.

days <1-365> selects the interval in days. Range: 1 to 365.

hours <1-8760> selects the interval in minutes. Range: 1 to 8760.

minutes <30-525600> selects the interval in seconds. Range: 30 to 525600.

count <1-1000> selects the number of times the job will be executed. When omitted, job execution triggering is indefinite.

start HH:MM [YYYY-MM-DD] selects the schedule first trigger time and date.

For example, setting the schedule to trigger once every 14 days, starting on January 1, with an execution limit of 500:

```
switch(config-schedule-Ev14D)# trigger every days 14 count 500 start 2022-01-01
```

[no] trigger at HH:MM [YYYY-MM-DD]

Sets the job to trigger one time only on a specific date and time. When the date is omitted, today's date is used for times at least 5 minutes into the future, otherwise tomorrow is selected. The no form removes the trigger.

For example, setting the schedule to trigger once only on August 26 at midnight:

```
switch(config-schedule-Aug26)# trigger at 00:00 2021-08-26
```

Usage

- A job can be used only once per schedule.
- To see the maximum number of schedules and jobs per schedule for your particular switch, use command **show capacities schedule**.
- Configure the jobs to be executed (using the **job** command) before configuring a schedule.
- Jobs must complete execution in under five minutes and are force-stopped after five minutes if they do not.

- A job must be scheduled to execute at least five minutes after its previous execution. If the same job is scheduled to be executed again within less than five minutes, the execution is skipped.

Examples

Creating a schedule named **PT2xW** that runs the port toggle job **PTog1** on Mondays and Fridays at 11:45 PM, starting on August 2 2021, with a one-year duration:

```
switch(config)# schedule PT2xW
switch(config-schedule-PT2xW)# desc Monday & Friday 11:45 PM port toggles
switch(config-schedule-PT2xW)# 10 job PTog1
switch(config-schedule-PT2xW)# trigger on 23:45 weekly 2,6 count 104 start 2021-
08-02
switch(config-schedule-PT2xW)# exit
switch(config)#
```

Creating a schedule named **RB_LDM** that runs the switch reboot job on the last day of the month at 3:00 AM, starting on January 31 2022, with a two-year duration:

```
switch(config)# schedule RB_LDM
switch(config-schedule-RB_LDM)# desc Monthly reboot 3:00 AM
switch(config-schedule-RB_LDM)# 10 job Reboot_sw1
switch(config-schedule-RB_LDM)# trigger on 3:00 monthly 31 count 24 start 2022-01-
31
switch(config-schedule-RB_LDM)# exit
```

For more information on features that use this command, refer to the Job Scheduler Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority

All platforms	`config`
	`config-schedule-<NAME>`
		Administrators or local user group members with execution rights for this command.

show job

`show job [<JOB-NAME>] [execution-output <INSTANCE-ID>]`

Description

Shows information about a specific job or every job. Optionally shows the job execution output log.

Parameter	Description
<JOB-NAME>	Specifies an existing job name. When omitted, information is shown for every job. Range: 1 to 64 characters (alphanumeric and "_" (underscore)).
<INSTANCE-ID>	Selects the job execution output instance with 1 selecting the most recent. To see the maximum number of job execution output instances for your particular switch, use command **show capacities job**.

Usage

Job execution statistics such as execution counts are reset to zero upon switch reboot.

Examples

Showing port toggle job information before execution has occurred:

```
switch# show job PTog1

Job Name : PTog1


    Enabled                 : Yes
    Description             : Toggle port 1/1/1
    Status                  : waiting
    Number of commands      : 5
    Total execution count   : 0
    Failed execution count  : 0

    Job CLI commands
    ----------------
    10 cli config
    20 cli interface 1/1/1
    30 cli shutdown
    40 delay 10 cli no shutdown
    50 cli end
```

Showing port toggle job information after execution has occurred:

```
switch# show job PTog1

Job Name : PTog1


    Enabled                 : Yes
    Description             : Toggle port 1/1/1
    Status                  : waiting
    Number of commands      : 5
    Total execution count   : 1
    Failed execution count  : 0

    Job execution history
    ---------------------

    Instance number         : 1
    Execution status        : success
    Execution start time    : Mon Aug 2 23:45:00 2021
    Execution duration     : 10s

    Job CLI commands
    ----------------
    10 cli config
    20 cli interface 1/1/1
    30 cli shutdown
    40 delay 10 cli no shutdown
    50 cli end
```

Showing port toggle job most recent execution output:

```
switch# show job PTog1 execution-output 1
=================================================================================
Command: config
time: Mon Aug  2 23:45:00 2021
=================================================================================

=================================================================================
Command: interface 1/1/1
time: Mon Aug  2 23:45:00 2021
=================================================================================

=================================================================================
Command: shutdown
time: Mon Aug  2 23:45:00 2021
=================================================================================

=================================================================================
Command: cli no shutdown
time: Mon Aug  2 23:45:10 2021
=================================================================================

=================================================================================
Command: end
time: Mon Aug  2 23:45:10 2021
=================================================================================
```

For more information on features that use this command, refer to the Job Scheduler Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities (job, schedule)

```
show capacities {job | schedule}
```

Description

Shows either job or schedule capacities information for your switch model.

Examples

Showing job capacities information (8320 example shown):

```
switch# show capacities job

System Capacities: Filter Job
Capacities Name                                                              Value
-----------------------------------------------------------------------------------
Maximum number of job execution output preserved per job                        10
Maximum number of jobs configurable in a system                                 32
```

Showing schedule capacities information (8320 example shown):

```
switch# show capacities Schedule

System Capacities: Filter Schedule
Capacities Name                                                              Value
-----------------------------------------------------------------------------------
Maximum number of jobs configurable in a schedule                               10
Maximum number of schedules configurable in a system                            32
```

For more information on features that use this command, refer to the Job Scheduler Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config (job, schedule)

```
show running-config [current-context]
```

Description

Shows the entire running configuration for the switch, including configuration details for the Job Scheduler job and schedule configuration.

Parameter	Description
`current-context`	When included from within the Job Scheduler job or schedule context, shows only the job or schedule configuration information for the selected job or schedule.

Examples

Showing the running configuration information for all jobs and schedules with unrelated configuration information omitted for clarity (omitted portions represented by ellipses("..."):

```
switch# show running-config

Current configuration:
...
!
job PTog1
    desc Toggle port 1/1/1
    10 cli config
    20 cli interface 1/1/1
    30 cli shutdown
    40 delay 10 cli no shutdown
    50 cli end
job Reboot_sw1
    desc Save config then reboot switch
    10 cli config
    20 cli write mem
    30 cli boot system
schedule PT2xW
    desc Monday & Friday 11:45 PM port toggles
    trigger on 23:45 weekly 2,6 count 104 start 2021-08-02
    10 job PTog1
schedule RB_LDM
    desc Monthly reboot 3:00 AM
    trigger on 3:00 monthly 31 count 24 start 2022-01-31
    10 job Reboot_sw1
...
```

From within the job **PTog1** context, showing the running configuration information for the job:

```
switch(config-job-PTog1)# show running-config current-context

Current configuration:
job PTog1
    desc Toggle port 1/1/1
    10 cli config
    20 cli interface 1/1/1
    30 cli shutdown
    40 delay 10 cli no shutdown
    50 cli end
```

From within the schedule **PT2xW** context, showing the running configuration information for the schedule:

```
switch(config-schedule-PT2xW)# show running-config current-context

Current configuration:
schedule PT2xW
    desc Monday & Friday 11:45 PM port toggles
    trigger on 23:45 weekly 2,6 count 104 start 2021-08-02
    10 job PTog1
```

For more information on features that use this command, refer to the Job Scheduler Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority

All platforms	Operator (>) or Manager (#)
	`config-job-<NAME>`
	`config-schedule-<NAME>`
		Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show schedule

`show schedule [<SCHEDULE-NAME>]`

Description

Shows information about a specific schedule or every schedule.

Parameter	Description
<SCHEDULE-NAME>	Specifies an existing job schedule name. When omitted, information is shown for every schedule. Range: 1 to 64 characters (alphanumeric and "_" (underscore)).

Usage

Schedule statistics such as **Triggered count** are reset to zero upon switch reboot.

Examples

Showing port toggle job schedule information before execution has occurred:

```
switch# show schedule PT2xW

Schedule Name: PT2xW
```

```
    Schedule config
    ---------------
    Description          : Monday & Friday 11:45 PM port toggles
    Enabled              : Yes
    Trigger type         : calendar
    Transient            : No
    Max trigger count    : 104
    Trigger start date   : 2021-08-02 23:45

    Schedule Status
    ---------------
    Trigger status       : active
    Next trigger time    : Mon Aug  2 23:45:00 2021

    Scheduled Jobs
    --------------
    10   : PTog1
```

Showing port toggle job schedule information after execution has occurred:

```
switch# show schedule PT2xW


Schedule Name: PT2xW

    Schedule config
    ---------------
    Description          : Monday & Friday 11:45 PM port toggles
    Enabled              : Yes
    Trigger type         : calendar
    Transient            : No
    Max trigger count    : 104
    Trigger start date   : 2021-08-02 23:45

    Schedule Status
    ---------------
    Trigger status       : active
    Next trigger time    : Fri Aug  6 23:45:00 2021
    Triggered count      : 1

    Scheduled Jobs
    --------------
    10   : PTog1
```

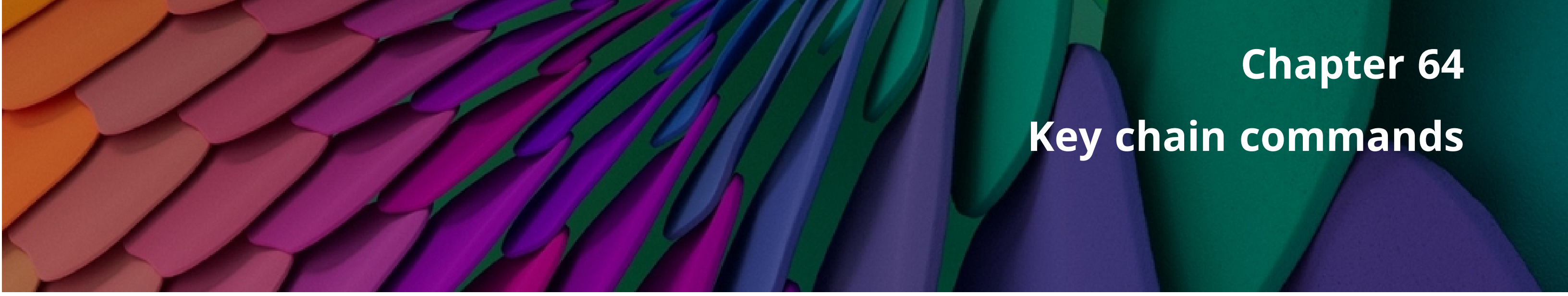
For more information on features that use this command, refer to the Job Scheduler Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 64

Key chain commands

accept-lifetime

```
accept-lifetime [start-time <time> <month>/<day>/<year>] {duration {<seconds> | infinite}
| end-time <time> <month>/<day>/<year>}
```

Description

Configures the duration for which the key is valid for receiving packets.

The **no** form of this command configures the key packet receiving duration to the default value of an infinite time.

Parameter	Description
`start-time`	Time at which the key chain lifetime starts. Required. Format: HH:MM:SS
`end-time`	Time at which the key chain lifetime expires. Required. Format: HH:MM:SS
`day`	Day of the month. Required. Range: 1-31.
`month`	Month of the year. Required.
`year`	Year. Required. Range: 2020-2050
`duration`	Time in seconds. Optional. Range: 1-2147483646.
`infinite`	Specifies infinite time for the key. Optional.

Examples

Configuring the duration for which the key is valid for receiving packets:

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# accept-lifetime start-time 10:10:10 10/25/2020 end-
time 10:10:10 11/25/2020
switch(config-keychain-key)# accept-lifetime start-time 10:10:10 10/25/2020
duration 1000
switch(config-keychain-key)# accept-lifetime start-time 10:10:10 10/25/2020
duration infinite
switch(config-keychain-key)# accept-lifetime end-time 10:10:10 11/25/2020
switch(config-keychain-key)# accept-lifetime duration 1000
switch(config-keychain-key)# accept-lifetime duration infinite
```

Configuring the key packet receiving duration to the default value of an infinite time:

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# no accept-lifetime
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-keychain-key`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

cryptographic-algorithm

```
recv-id cryptographic-algorithm {aes-cmac-128 |hmac-sha-1 | hmac-sha-256 | hmac-sha-384 |
hmac-sha-512 | md5}
no cryptographic-algorithm
```

Description

Configures the recv-id cryptographic algorithm for the key. The key will not be valid until the receive ID, the send ID, and send lifetime is configured for TCP-AO, Choose one of the authentication algorithms from the following parameters. The **no** form of this command configures the default cryptographic algorithm for a key, md5.

TCP Authentication Option (TCP-AO) authentication supports only the *aes-cmac-128* and *hmac-sha-1* algorithms. If you are configuring TCP-AO, you must select one of these options.

Parameter	Description
`aes-cmac-128`	Sets the authentication algorithm for the key to AES-CMAC-128. This parameter is only supported for TCP-AO.
`hmac-sha-1`	Sets the authentication algorithm for the key to SHA-1. This parameter is also supported for TCP-AO.
`hmac-sha-256`	Sets the authentication algorithm for the key to SHA-256.
`hmac-sha-384`	Sets the authentication algorithm for the key to SHA-384.
`hmac-sha-512`	Sets the authentication algorithm for the key to SHA-512.

Parameter	Description
md5	Sets the authentication algorithm for the key to md5. Maximum length of the key string supported: 16 bytes (**config**-if context), 64 bytes (**config-keychain-key context**).

Examples

Set the authentication algorithm for the key to **SHA-384**:

```
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# recv-id cryptographic-algorithm hmac-sha-384
```

Set the authentication algorithm to the default, **md5**:

```
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# no recv-id cryptographic-algorithm
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.11	The **aes-cmac-128** parameter is introduced.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-keychain-key	Administrators or local user group members with execution rights for this command.

key

`key <KEY-ID>`

Description

Creates the key for a key chain and enters the key chain key context. A maximum of 64 keys can be configured per key chain.

The **no** form of this command deletes the key from the key chain.

Parameter	Description
<KEY-ID>	ID of the key. Required. Range: 1-255.

Examples

Creating a key for a key chain:

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
```

Deleting a key from a key chain:

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# no key 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-keychain`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

keychain

`keychain <KEYCHAIN-NAME>`

Description

Creates the key chain and enters the key chain context. A maximum of 64 key chains can be configured in the system.

The **no** form of this command removes the key chain if it is not used by any subscribers.

Parameter	Description
<KEYCHAIN-NAME>	Name of the key chain. Required.

Examples

Creating a key chain:

```
switch# configure terminal
switch(config)# keychain ospf_keys
```

Removing a key chain:

```
switch# configure terminal
switch(config)# keychain ospf_keys
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

key-string

`key-string [{ciphertext | plaintext} <PASSWORD>]`

Description

Sets the key password. The password is internally stored in encrypted form. The key is not valid until its password has been set.

The **no** form of this command deletes the password used for the key.

Parameter	Description
ciphertext	Specifies that the key password is provided as ciphertext.
plaintext	Specifies that the key password is provided as plaintext.
<PASSWORD>	Specifies the key password.

When the key password is not provided on the command line, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

Examples

Setting the key password with plaintext:

```
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# key-string plaintext F82#450bHP
```

Setting the key password with plaintext prompting:

```
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# key-string
Enter the key password: *************
Re-Enter the key password: *************
```

Setting the key password with ciphertext:

```
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# key-string ciphertext AQBpfciFZ/P...biAAAOjc0a8=
```

Deleting the password for the key:

```
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# no key-string
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-keychain-key`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

name

```
name <KEY-NAME>
no name <KEY-NAME>
```

Description

Configures a name for a numbered key in a key chain.

The **no** form of this command removes the name of the key.

Parameter	Description
<KEY-NAME>	Specifies the name of the key in alphanumeric characters. Range: 1-64.

Examples

Creating a name for a key in a key chain called **abcdef123456**:

```
switch# configure terminal
switch(config)# keychain macsec_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# name abcdef123456
```

Removing the name of the key named **abcdef123456**:

```
switch# configure terminal
switch(config)# keychain macsec_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# no name abcdef123456
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.11	Command added.

Command Information

Platforms	Command context	Authority
All platforms	`config-keychain-key`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

recv-id

`recv-id <0-255>`

Description

Configures the receive ID for a keychain key. The receive ID has to be unique across keys in the keychain.

The **no** form of this command configures removes the recv-id value. The receive ID can not be changed for an active key of a keychain which is associated with BGP neighbor.

Parameter	Description
`<0-255>`	Set the receive ID corresponding to the keychain key. Supported values are 0-255.

Examples

Configuring the receive ID for the keychain key.

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# recv-id 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-keychain-key`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

send-lifetime

```
send-lifetime [start-time <time> <month>/<day>/<year>] {duration {<seconds> | infinite} |
end-time <time> <month>/<day>/<year>}
```

Description

Configures the duration for which the key is valid for sending packets.

The **no** form of this command configures the key packet sending duration to the default value of an infinite time.

Parameter	Description
`start-time`	Time at which the key chain lifetime starts. Required. Format: HH:MM:SS
`end-time`	Time at which the key chain lifetime expires. Required. Format: HH:MM:SS
`day`	Day of the month. Required. Range: 1-31.

Parameter	Description
`month`	Month of the year. Required.
`year`	Year. Required. Range: 2020-2050
`duration`	Time in seconds. Optional. Range: 1-2147483646.
`infinite`	Specifies infinite time for the key. Optional.

Examples

Configuring the duration for which the key is valid for sending packets:

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# send-lifetime start-time 10:10:10 10/25/2020 end-time
10:10:10 11/25/2020
switch(config-keychain-key)# send-lifetime start-time 10:10:10 10/25/2020 duration
1000
switch(config-keychain-key)# send-lifetime start-time 10:10:10 10/25/2020 duration
infinite
switch(config-keychain-key)# send-lifetime end-time 10:10:10 11/25/2020
switch(config-keychain-key)# send-lifetime duration 1000
switch(config-keychain-key)# send-lifetime duration infinite
```

Configuring the key packet sending duration to the default value of an infinite time:

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# no send-lifetime
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-keychain-key`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

send-id

`send-id <0-255>`

Description

Configures the send ID for a keychain key. The send ID has to be unique across keys in the keychain.

The **no** form of this command configures removes the send-id value. The send id can not be changed for an active key of a keychain which is associated with BGP neighbor.

Parameter	Description
`<0-255>`	Set the send IDcorresponding to the keychain key. Supported values are 0-255.

Examples

Configuring the send ID for the keychain key.

```
switch# configure terminal
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# send-id 218
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-keychain-key`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities keychain

`show capacities keychain`

Description

Shows the maximum number of key chains and keys configurable in a key chain.

Example

```
switch# show capacities keychain

System Capacities: Filter Keychain
Capacities Name
                   Value
```

```
----------------------------------------------------------------------------------
-------------------------
Maximum number of keychains supported in the system
                    64
Maximum number of Keys supported in a single Keychain
                    64
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>)	Administrators or local user group members with execution rights for this command.

show keychain

`show keychain [<KEYCHAIN-NAME>]`

Description

Shows information about configured and active keys of a named key chain or (if **keychain-name** is not specified) all configured key chains.

Parameter	Description
<KEYCHAIN-NAME>	Name of the key chain. Optional.

Example

```
switch# show keychain
Keychain Name : macsec_keys
  Number of Keys      : 1
  Active Send Key ID  :
  Active Recv Key IDs :

  Key ID : 1
    Key name          : abcdef123456
    Key string        :
AQBapYa+0qQDzcakbB1TopeX0AMYDDWDW015orkH5mY3qJDaBAAAADASiBQ=
    Send Key Validity : 00:00:00 01/01/2020 to Infinite
    Recv Key Validity : 00:00:00 01/01/2020 to Infinite

Keychain Name : ospf_keys
  Number of Keys      : 2
```

~~~
  Active Send Key ID  : 7
  Active Recv Key IDs : 7, 200

  Key ID              : 7
    Key name          : -
    Key string        :
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    Crypto-Algorithm  : sha256
    Send Key Validity : 00:00:01 10/1/2020 to 23:59:01 10/1/2021
    Recv Key Validity : 00:00:01 10/1/2020 to infinite
  Key ID              : 200
    Key name          : -
    Key string        :
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    Crypto-Algorithm  : sha512
    Send Key Validity : 00:00:01 10/1/2020 to 23:59:01 10/1/2021
    Recv Key Validity : 00:00:01 10/1/2020 to 23:59:01 10/1/2021

Keychain Name : bgp_keys
  Number of Keys      : 2
  Active Send Key ID  : 7
  Active Recv Key IDs : 7

  Key ID              : 7
    Key name          : -
    Key string        :
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    Crypto-Algorithm  : md5
    Send Key Validity : 00:00:01 10/26/2020 to 23:59:01 10/1/2021
    Recv Key Validity : 00:00:01 10/22/2020 to infinite
  Key ID              : 8
    Key name          : -
    Key string        :
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    Crypto-Algorithm  : sha384
    Send Key Validity : 00:00:01 10/1/2021 to 23:59:01 10/1/2021
    Recv Key Validity : 00:00:01 10/1/2021 to 23:59:01 10/1/2021
```
```
Keychain Name : ospf_keys
  Number of Keys      : 2
  Active Send Key ID  : 7
  Active Recv Key IDs : 7, 200

  Key ID              : 7
    Key name          : -
    Key string        :
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    Crypto-Algorithm  : sha256
    Send Key Validity : 00:00:01 10/1/2020 to 23:59:01 10/1/2021
    Recv Key Validity : 00:00:01 10/1/2020 to infinite
  Key ID              : 200
    Key name          : -
    Key string        :
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    Crypto-Algorithm  : sha512
    Send Key Validity : 00:00:01 10/1/2020 to 23:59:01 10/1/2021
    Recv Key Validity : 00:00:01 10/1/2020 to 23:59:01 10/1/2021
~~~

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>)	Administrators or local user group members with execution rights for this command.

show running-config keychain

```
show runnning-config keychain
```

Description

Shows the configurations for key chain protocol.

Example

```
switch# show running-config keychain
keychain ospf_keys
  key 1
    key-string ciphertext
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    cryptographic-algorithm md5
    accept-lifetime start-time 10:10:10 10/25/2020 end-time 10:10:10 11/25/2020
    send-lifetime start-time 10:10:10 10/25/2020 end-time 10:10:10 11/25/2020
  key 45
    key-string ciphertext
AQBapZ1OHiO9W3JwRqnjtLfbV73BPLS1S6TGVg+Lzl7N4e5eBAAAAPWaPBE=
    accept-lifetime start-time 10:10:10 10/25/2020 end-time 10:10:10 11/25/2020
  key 33
keychain macsec_keys
  key 1
    name abcdef123456
    key-string ciphertext
AQBapYa+0qQDzcakbB1TopeX0AMYDDWDW015orkH5mY3qJDaBAAAADASiBQ=
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>)	Administrators or local user group members with execution rights for this command.

Chapter 65

L1-100Mbps downshift commands

downshift enable

```
downshift-enable
no downshift-enable
```

Description

Enables/disables automatic speed downshift on an interface that supports downshift, generally 1GBASE-T ports. When enabled, downshift allows an interface to link at a lower advertised speed when unable to establish a stable link at the maximum speed. Downshifting only applies to physical interfaces that are not members of a LAG and is only available when auto-negotiation is enabled. When only one speed is advertised, downshift will not be triggered.

Examples

```
switch(config-if)# interface 1/1/1
switch(config-if)# downshift-enable

Warning: this is a non-standard mode for use only when standards-based
auto-negotiation is not able to establish a stable link. Enabling this
may cause the port to link at a lower than expected speed and should
not be used on ports that are members of a LAG. Support calls may require
this feature to be disabled

Continue (y/n)?

switch(config-if)#
```

When automatic downshift is enabled:

```
switch(config-if)# show running-config interface
interface 1/1/1
    downshift-enable
```

Disabling automatic speed downshift:

```
switch(config-if)# interface 1/1/1
switch(config-if)# no downshift-enable
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show interface

```
show interface [<IFNNAME>|<IFRANGE>] [brief | physical]
show interface [<IFNNAME>|<IFRANGE>] [extended [non-zero] | [human-readable]]
show interface [<IFNNAME>] monitor [human-readable]
show interface [lag | loopback | tunnel | vlan ] [<ID>] [brief]
show interface lag [<LAG-ID>] [extended [non-zero] | [human-readable]]
show interface lag [<LAG-ID>] monitor [human-readable]
```

Description

Shows active configurations and operational status information for interfaces.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.
`brief`	Shows brief info in tabular format.
`physical`	Shows the physical connection info in tabular format.
`extended`	Shows additional statistics, including the **tx filtered** and **rx filtered** counters. ■ Rx filter packets are protocol packets received when the protocol is disabled on the switch and there is only one port in the VLAN. Protocols include OSPF, PIM, RIP, LACP, and LLDP. ■ An example of a Tx filtered packet would be a multicast packet being filtered from going out of the ingress port.
`human-readable`	Shows statistics rounded to the nearest power of 1000, for example, 1K, 345M, 2G. This is available only in the CLI interface output.
`non-zero`	Shows only non zero statistics.
`LAG`	Shows LAG interface information.
`monitor`	Continuously monitor interface statistics.
`LOOPBACK`	Shows loopback interface information.

Parameter	Description
`TUNNEL`	Shows tunnel interface information.
`VLAN`	Shows VLAN interface information.
`<LAG-ID>`	Specifies the LAG number. Range: 1-256
`<LOOPBACK-ID>`	Specifies the LOOPBACK number. Range: 0-255
`<TUNNEL-ID>`	Specifies the tunnel ID. Range: 1-255
`<VLAN-ID>`	Specifies the VLAN ID. Range: 1-4094
`VXLAN`	Shows the VXLAN interface information.
`<VXLAN-ID>`	Specifies the VXLAN interface identifier. Default: 1

Examples

Showing interface information when it is configured as a route-only port:

```
switch# show interface 1/1/1
Interface 1/1/1 is up
Admin state is up
Link state: up for 2 days (since Sun Jun 21 05:30:22 UTC 2020)
Link transitions: 1
Description: backup data center link
Hardware: Ethernet, MAC Address: 70:72:cf:fd:e7:b4
MTU 1500
Type 1GbT
Full-duplex
qos trust none
Speed 1000 Mb/s
Auto-negotiation is on
Flow-control: off
Error-control: off
Energy-Efficient Ethernet is enabledMDI mode: MDIX
L3 Counters: Rx Enabled, Tx Enabled
Rate collection interval: 300 seconds
Rates                           RX                   TX        Total (RX+TX)
------------- -------------------- -------------------- --------------------
Mbits / sec                   0.00                 0.00                 0.00
KPkts / sec                   0.00                 0.00                 0.00
Unicast                       0.00                 0.00                 0.00
Multicast                     0.00                 0.00                 0.00
Broadcast                     0.00                 0.00                 0.00
Utilization %                 0.00                 0.00                 0.00
Statistics                      RX                   TX                Total
------------- -------------------- -------------------- --------------------
Packets                          0                    0                    0
Unicast                          0                    0                    0
Multicast                        0                    0                    0
Broadcast                        0                    0                    0
Bytes                            0                    0                    0
Jumbos                           0                    0                    0
Dropped                          0                    0                    0
Filtered                         0                    0                    0
Pause Frames                     0                    0                    0
```

```
L3 Packets                       0                    0                    0
L3 Bytes                         0                    0                    0
Errors                           0                    0                    0
CRC/FCS                          0                  n/a                    0
Collision                      n/a                    0                    0
Runts                            0                  n/a                    0
Giants                           0                  n/a                    0
Other                            0                    0                    0
```

Showing information when the interface is currently linked at a downshifted speed:

```
switch(config-if)# show interface 1/1/1
Interface 1/1/1 is up
...
Auto-negotiation is on with downshift active
```

Showing information when the interface is currently linked with energy-efficient-ethernet negotiated:

```
switch(config-if)# show interface 1/1/1
Interface 1/1/1 is up
...
Energy-Efficient Ethernet is enabled and active
```

Showing information when the interface is shut down during a VSX split:

```
switch(config-if)# show interface 1/1/1
Interface 1/1/1 is down
Admin state is up
State information: Disabled by VSX
Link state: down for 3 days (since Tue Mar 16 05:20:47 UTC 2021)
Link transitions: 0
Description:
Hardware: Ethernet, MAC Address: 04:09:73:62:90:e7
MTU 1500
Type SFP+DAC3
Full-duplex
qos trust none
Speed 0 Mb/s
Auto-negotiation is off
Flow-control: off
Error-control: off
VLAN Mode: native-untagged
Native VLAN: 1
Allowed VLAN List: 1502-1505
Rate collection interval: 300 seconds

Rate                               RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
Mbits / sec                      0.00                 0.00                 0.00
KPkts / sec                      0.00                 0.00                 0.00
Unicast                          0.00                 0.00                 0.00
Multicast                        0.00                 0.00                 0.00
Broadcast                        0.00                 0.00                 0.00
Utilization                      0.00                 0.00                 0.00
```

```
Statistic                          RX                   TX                Total
---------------- -------------------- -------------------- --------------------
Packets                             0                    0                    0
Unicast                             0                    0                    0
Multicast                           0                    0                    0
Broadcast                           0                    0                    0
Bytes                               0                    0                    0
Jumbos                              0                    0                    0
Dropped                             0                    0                    0
Pause Frames                        0                    0                    0
Errors                              0                    0                    0
CRC/FCS                             0                  n/a                    0
Collision                         n/a                    0                    0
Runts                               0                  n/a                    0
Giants                              0                  n/a                    0
```

Showing information when the interface is configured with EEE and the EEE has auto-negotiated:

```
switch(config-if)# show interface 1/1/1 physical
----------------------------------------------------------------------------------
----------------------------------------------------------
                            Link    Admin         Speed           Flow-Control
     EEE       PoE Power                          Port
Port        Type           Status   Config   Status | Config    Status | Config
Status | Config  (Watts)    State Information  Description
----------------------------------------------------------------------------------
----------------------------------------------------------
1/1/1       1GbT           up       up       1G       auto      off      off
on       on       --        10M/100M/1G        --
```

Showing the monitor information:

In monitor mode, the CLI refreshes data automatically until it is exited by entering **q**. Pressing **?** opens the help menu to display which options are available in this context.

```
Interface 1/1/1 is up
Rate                               RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
MBits / sec                  30196.43             30196.43             60392.85
MPkts / sec                  58977.39             58977.40            117954.79
Unicast                          0.00                 0.00                 0.00
Multicast                    58977.39             58977.40            117954.79
Broadcast                        0.00                 0.00                 0.00
Utilization %                   75.49                75.49               150.98
Statistic                          RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
Packets                    4756527649           4756527865           9513055514
Unicast                             0                    0                    0
Multicast                  4756527649           4756527865           9513055514
Broadcast                           2                    0                    2
Bytes                    304417778668         304417795428         608835574096
Jumbos                              0                    0                    0
Dropped                             0          19028847730          19028847730
Pause Frames                        0                    0                    0
Errors                              0                    0                    0
CRC/FCS                             0                  n/a                    0
help: ?, quit: q
```

```
Help for Interface Monitor
h  Toggle human-readable mode
c  Clear interface statistics
Does not apply to rates
Arrows, PgUp, PgDn, Home, End
Navigate interface statistics
Delay: 2
help: ?, quit: q
```

Showing the output for interface 1/1/1 in human-readable format:

In human-readable format, the **< 1** symbol for **Utilization** indicates that the amount of packets is between zero and one. This is true in cases where the number of bytes increases but the number of packets and the **Utilization** value is not displayed even in the normal output, where the human-readable parameter is not included in the command.

```
switch(config-if)# show interface 1/1/1 human-readable
Interface 1/1/1 is up
Rate                               RX                   TX       Total  (RX+TX)
---------------- -------------------- -------------------- --------------------
Bits / sec                         3M                   3M                   6M
Pkts / sec                        316                  316                  633
Unicast                           319                  319                  638
Multicast                           0                    0                    0
Broadcast                           0                    0                    0
Utilization %                     < 1                  < 1                  < 1
Statistic                          RX                   TX                Total
---------------- -------------------- -------------------- --------------------
Packets                          577K                 577K                   1M
Unicast                          577K                 577K                   1M
Multicast                           0                   51                   51
Broadcast                           0                   15                   15
Bytes                            744M                 745M                   1G
Jumbos                              0                    0                    0
Dropped                             0                    0                    0
Filtered                            0                    0                    0
Pause Frames                        0                    0                    0
Errors                              0                    0                    0
CRC/FCS                             0                  n/a                    0
Collision                         n/a                    0                    0
Runts                               0                  n/a                    0
Giants                              0                  n/a                    0
```

Showing information about extended counters:

The output of the `show interface extended` command varies depending on the switch model and configuration.

```
switch(config-if)# show interface 1/1/17 extended
-------------------------------------------------------------------
Interface 1/1/17
-------------------------------------------------------------------
Statistics                                     Value
-------------------------------------------------------------------
Dot1d Tp Port In Frames                        547
```

```
Dot1d Tp Port Out Frames                       608
Dot3 In Pause Frames                           0
Dot3 Out Pause Frames                          0
Ethernet Stats Broadcast Packets               19
Ethernet Stats Bytes                           40162
Ethernet Stats Packets                         342
...
-------------------------------------------------------------------
Error-Statistics                               Value
-------------------------------------------------------------------
Dot1d Base Port MTU Exceeded Discards          0
Dot3 Control In Unknown Opcodes                0
Dot3 Stats Alignment Errors                    0
Dot3 Stats FCS Errors                          0
Dot3 Stats Frame Too Longs                     0
Dot3 Stats Internal Mac Transmit Errors        0
Ethernet RX Oversize Packets                   0
...
```

Showing interface link-status:

```
switch# show interface link-status
-------------------------------------------------------------


Port           Type           Physical    Link         Last
                              Link State  Transitions  Change
-------------------------------------------------------------
1/1/1          1G-BT          down        0            --
1/1/2          1G-BT          up          1            1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
1/1/3          1G-BT          up          1            1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
1/1/4          --             down        0            --
1/1/5          --             down        0            --
```

Showing interface loopback 1 link-status:

```
-------------------------------------------------------------
                              Physical    Link         Last
Port           Type           Link State  Transitions  Change
-------------------------------------------------------------
loopback1      --             up          --           --
```

Showing interface 1/1/2-1/1/3 link-status:

```
-------------------------------------------------------------
                              Physical    Link         Last
Port           Type           Link State  Transitions  Change
-------------------------------------------------------------
1/1/2          1G-BT          up          1            1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
1/1/3          1G-BT          up          1            1 minute ago (Fri Mar 09
12:36:56 UTC 2018)
```

Showing interface link-status:

```
switch# show interface link-status
-------------------------------------------------------------------------
Port            Type             Physical    Link        Link Flaps  Last
                                 Link State  Transitions Ignored     Change
-------------------------------------------------------------------------
1/1/1           1G-BT            down        0           0           --
1/1/2           1G-BT            up          1           0           1 minute ago
(Fri Mar 09 12:36:56 UTC 2018)
1/1/3           1G-BT            up          1           0           1 minute ago
(Fri Mar 09 12:36:56 UTC 2018)
1/1/4           --               down        0           0           --
1/1/5           --               down        0           0           --
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

Command History

Release	Modification
10.11	Added `monitor` parameter.
10.10	Added `human-readable` parameter.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface downshift-enable

```
show interface [<IFNNAME>|<IFRANGE>] downshift-enable
```

Description

Displays speed downshift information, including the interface speed status and configuration.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.

Examples

Showing automatic downshift information:

```
switch(config-if)# show interface downshift-enable
-------------------------------------------------
              Downshift             Speed
Port      Enabled | Active    Status    | Config
-------------------------------------------------
1/1/1     yes       yes       100M-FDx   auto
1/1/2     yes       no        1G         auto
1/1/3     yes       no        100M-FDx   100M-FDx
1/1/4     no        no        --         auto
```

Showing automatic downshift information on per interface:

```
switch(config-if)# show interface 1/1/2 downshift-enable
-------------------------------------------------
              Downshift             Speed
Port      Enabled | Active    Status    | Config
-------------------------------------------------
1/1/2     yes       no        1G         auto
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config interface

```
show running-config interface [<IFNNAME>|<IFRANGE>]
show running-config interface [lag | loopback | tunnel | vlan ] [<ID>]
```

Description

Displays active configurations of various switch interfaces.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.

Parameter	Description
LAG	Specifies LAG interface information
LOOPBACK	Specifies loopback interface information.
TUNNEL	Specifies tunnel interface information.
VLAN	Specifies VLAN interface information.
<LAG-ID>	Specifies the LAG number. Range: 1-256.
<LOOPBACK-ID>	Specifies the LOOPBACK number. Range: 0-255.
<TUNNEL-ID>	Specifies the tunnel ID. Range: 1-255.
<VLAN-ID>	Specifies the VLAN ID. Range: 1-4094.
VXLAN	Specifies the VXLAN interface information.
<VXLAN-ID>	Specifies the VXLAN interface identifier. Default: 1.

Examples

Showing 1/1/2 interface configuration:

```
switch(config-if)# show running-config interface 1/1/2

interface 1/1/2
   no shutdown
   description DC-23
   exit
```

Showing loopback interfaces configured:

```
switch(config-if)# show running-config interface loopback

interface loopback 1
    description lb interface 1
    exit
interface loopback 2
    description lb interface 2
    exit
```

Showing loopback interfaces not configured:

```
switch(config-if)# show running-config interface loopback

No loopback interfaces configured.
```

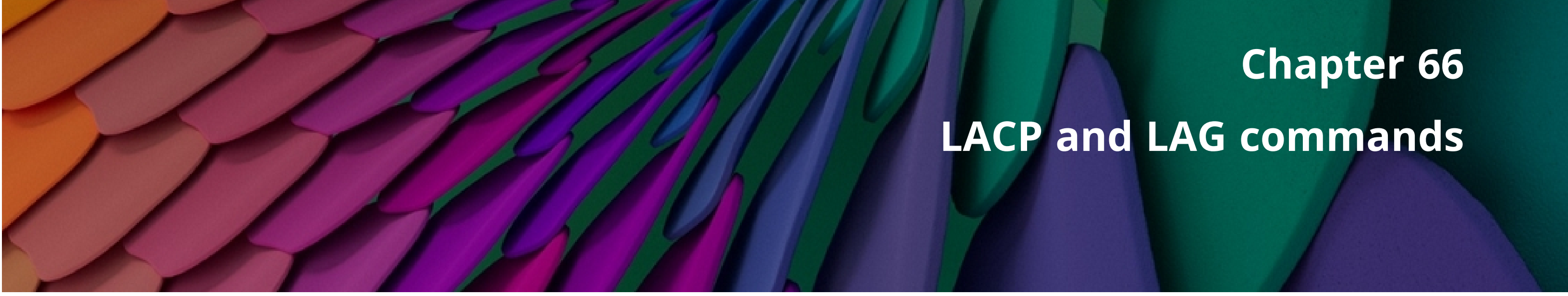
For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 66

LACP and LAG commands

description

```
description <TEXT>
no description <TEXT>
```

Description

Provides a brief description of the LAG interface. The description text is saved in the configuration of the LAG. It is available even after a reboot.

The no form of this command removes the description of the LAG interface from the configuration.

Parameter	Description
<TEXT>	Specifies the description of the LAG interface.

Example

```
switch(config)# interface lag 10
switch(config-lag-if)# description This LAG is used for an example.
switch(config-lag-if)# show running-config
...
vlan 1
interface lag 10
     description This LAG is used for an example.
interface lag 60
switch(config-lag-if)#
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-lag-if`	Administrators or local user group members with execution rights for this command.

hash

```
hash [l2-src-dst | l3-src-dst | l4-src-dst]
```

Description

This command controls the selection of an interface in a group of aggregate interfaces. The hash type value helps transmit a frame. This configuration must be done at the LAG interface level.

Parameter	Description
`l2-src-dst`	Specifies the load-balancing calculation to include only layer 2 items, such as source and destination MAC addresses.
`l3-src-dst`	Specifies the load-balancing calculation to include only layer 3 items, such as source and destination IP addresses. Default setting.
`l4-src-dst`	Specifies the load-balancing calculation to include only layer 4 items, such as source and destination UDP/TCP ports.

Example

```
switch(config-lag-if)# hash l2-src-dst
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-lag-if`	Administrators or local user group members with execution rights for this command.

interface lag

```
interface lag <ID>
no interface lag <ID>
```

Description

Creates a Link Aggregation Group (LAG) interface represented by an ID.

The **no** form of this command deletes a LAG interface represented by an ID.

Parameter	Description
<ID>	Specifies a LAG interface ID.

Usage

Keep in mind the following requirements when adding interfaces to a LAG:

- To determine the maximum number of LAG interfaces for your type of switch, look at the output from the **show capacities lag** command; however, the number of LAGs that can be created depends on the availability of the physical interface since each LAG interface needs at least one physical interface as a member link.
- After the maximum limit of members is reached in a LAG, an additional port cannot be added to the aggregation group. If a port belongs to a card type with a different speed than the other aggregation members, the port can still be added to the aggregation group. If dynamic LAG is enabled, any port member with a speed different than other aggregation members is blocked or ineligible from the same aggregation group. Any operational keys/attributes or configuration changes might affect the aggregation states of the member ports.
- The nondefaults configuration on an interface is removed automatically when the interface is added to a link aggregation. For example: Assume that you remove a member interface from an existing LAG and add it to another LAG. The software removes the nondefault configurations on the interface when it is added to the new LAG.

Examples

Creating a Link Aggregation Group (LAG) interface represented by an ID of 100:

```
switch(config)# interface lag 100
```

Deleting a Link Aggregation Group (LAG) interface represented by an ID of 100:

```
switch(config)# no interface lag 100
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

ip address

```
ip address <IPV4-ADDR>/<MASK> [secondary]
no ip address <IPV4-ADDR>/<MASK> [secondary]
```

Description

Sets an IPv4 address and subnet mask to a LAG interface. One primary and up to 31 secondary address can be configured per interface.

The **no** form of this command removes the IPv4 address from the interface.

Parameter	Description
`<IPV4-ADDR>`	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address **192.169.005.100** becomes **192.168.5.100**.
`<MASK>`	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32.
`secondary`	Specifies a secondary IP address.

Examples

Setting an IP address on the LAG interface 1 to 198.51.100.1 with a mask of 24 bits:

```
switch(config)# interface lag 1
switch(config-lag-if)# ip address 198.51.100.1/24
```

Removing the IP address 198.51.100.1 with a mask of 24 bits from LAG interface 1:

```
switch(config)# interface lag 1
switch(config-lag-if)# no ip address 198.51.100.1/24
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-lag-if`	Administrators or local user group members with execution rights for this command.

ipv6 address

```
ipv6 address <IPV6-ADDR>/<MASK>
no ipv6 address <IPV6-ADDR>/<MASK>
```

Description

Sets an IPv6 address and subnet mask to a LAG interface.

The **no** form of this command removes the IPv6 address from the interface.

Parameter	Description
<IPV6-ADDR>	Specifies the IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. You can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a quartet of four zeros to a single 0. For example, this address **2222:0000:3333:0000:0000:0000:4444:0055** becomes **2222:0:3333::4444:55**.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.

Examples

Setting the IPv6 address on LAG interface 1 to 2001:0db8:85a3::8a2e:0370:7334 with a mask of 24 bits:

```
switch(config)# interface lag 1
switch(config-lag-if)# ipv6 address 2001:0db8:85a3::8a2e:0370:7334/24
```

Removing the IP address 2001:0db8:85a3::8a2e:0370:7334 with mask of 24 bits with a mask of 24 bits from LAG interface 1:

```
switch(config)# interface lag 1
switch(config-lag-if)# no ipv6 address 2001:0db8:85a3::8a2e:0370:7334/24
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-lag-if`	Administrators or local user group members with execution rights for this command.

lacp fallback

```
lacp fallback
no lacp fallback
```

Description

Configures the LACP fallback on LAG port.

The no form of this command sets the LAG to BLOCK state if no LACP partner is detected.

Usage

This makes members of the LAG function as non-bonded interfaces when no LACP partner is detected. This configuration is only applicable when the LAG is of type MCLAG. If the member port does not get an LACP frame, the port is in IE state.

Examples

Configuring LACP fallback on LAG port.

```
switch(config)# int lag 1 multi-chassis
switch(config-lag-if)# no sh
switch(config-lag-if)# lacp mode active
switch(config-lag-if)# lacp fallback
```

Configuring the LAG to BLOCK state when no LACP partner is detected.

```
switch(config)# int lag 1 multi-chassis
switch(config-lag-if)# no sh
switch(config-lag-if)# lacp mode active
switch(config-lag-if)# no lacp fallback
```

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6400	`config-if` `config-lag-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

lacp fallback-static

```
lacp fallback-static
no lacp fallback-static
```

Description

Configures the LACP fallback-static on LAG port.

The no form of this command sets the LAG to BLOCK state if no LACP partner is detected.

Usage

This makes members of the LAG function as non-bonded interfaces when no LACP partner is detected. One member interface that is part of the LAG stays up and forwards traffic, while the other members are in lacp-block state. This configuration is applicable when the lag is of type LACP and ignored in other cases. When this command is configured, only one member of LAG is selected to be UP. Enabling multiple members results in configuration mismatch on peer, loop, mac-learning issues, and more.

Examples

Configuring LACP fallback-static on LAG port.

```
switch(config)# interface lag 1
switch(config-lag-if)# lacp mode active
switch(config-lag-if)# lacp fallback-static
```

Configuring the LAG to BLOCK state when no LACP partner is detected.

```
switch(config)# interface lag 1
switch(config-lag-if)# no lacp fallback-static
```

Configuring LACP fallback-static on static port.

```
switch(config-lag-if)# lacp fallback-static
Cannot enable LACP fallback-static on static LAG.
```

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-if` `config-lag-if`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

lacp mode

```
lacp mode {active | passive}
no lacp mode {active | passive}
```

Description

Sets an LACP mode to active or passive.

The **no** form of this command sets the LACP mode to **off**, returning the LAG to a static mode aggregation.

Parameter	Description
`active`	Specifies that the local switch will transmit LACP Data Units

Parameter	Description
	(LACPDUs) to attempt to negotiate with the remote device.
`passive`	Specifies that the local switch will listen for LACPDUs from the remote device for LACP negotiation. **NOTE:** A momentary traffic drop occurs because LACP partners reconverge when changing the mode from active to passive or from passive to active.

Examples

Setting the LACP mode to `active`:

```
switch(config)# interface lag 1
switch(config-lag-if)# lacp mode active
```

Setting the LACP mode to `off`:

```
switch(config)# interface lag 1
switch(config-lag-if)# no lacp mode active
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-lag-if`	Administrators or local user group members with execution rights for this command.

lacp port-id

```
lacp port-id <PORT-ID>
no lacp port-id
```

Description

Sets the LACP port ID value of the member interface of the LAG.

The **no** form of this command removes the LACP port ID value from the interface.

Parameter	Description
<PORT-ID>	Specifies a port ID value. Range: 1 to 65535.

Examples

Setting an LACP port ID to a value of 10:

```
switch(config-if)# lacp port-id 10
```

Removing the LACP port ID value:

```
switch(config-if)# no lacp port-id
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

lacp port-priority

```
lacp port-priority <PORT-PRIORITY>
no lacp port-priority
```

Description

Sets an LACP port priority value for the member interface of the LAG.

The **no** form of this command reverts the LACP port priority to the default, which is 1.

Parameter	Description
<PORT-PRIORITY>	Specifies a port priority value. Range: 1 to 65535.

Examples

Setting a LACP port priority value of 10:

```
switch(config-if)# lacp port-priority 10
```

Reverting the LACP port ID to the default:

```
switch(config-if)# no lacp port-priority
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

lacp rate

```
lacp rate {fast | slow}
no lacp rate {fast | slow}
```

Description

Sets an LACP heartbeat request time to fast or slow.

The **no** form of the command sets an LACP rate to **slow**.

Parameter	Description
`fast`	Specifies the heartbeat request to every second, and the timeout period is a three-consecutive heartbeat loss that is 3 seconds.
`slow`	Specifies the heartbeat request to every 30 seconds. The timeout period is three-consecutive heartbeat loss that is 90 seconds. Default setting.

Examples

Setting the LACP heartbeat request time to `fast`:

```
switch(config)# interface lag 1
switch(config-lag-if)# lacp rate fast
```

Resetting the LACP heartbeat request time to the default, which is `slow`:

```
switch(config)# interface lag 1
switch(config-lag-if)# no lacp rate
```

Another way to set the LACP heartbeat request time to the default, which is `slow`:

```
switch(config)# interface lag 1
switch(config-lag-if)# lacp rate slow
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-lag-if`	Administrators or local user group members with execution rights for this command.

lacp system-priority

```
lacp system-priority <SYSTEM-PRIORITY-VALUE>
no lacp system-priority <SYSTEM-PRIORITY-VALUE>
```

Description

Sets a Link Aggregation Control Protocol (LACP) system priority.

The **no** form of this command sets an LACP system priority to the default, which is 65534.

Parameter	Description
<SYSTEM-PRIORITY-VALUE>	Specifies a system priority value. Range: 0 to 65535.

Examples

Setting a Link Aggregation Control Protocol (LACP) system priority to 100:

```
switch(config)# lacp system-priority 100
```

Setting an LACP system priority to the default (65534):

```
switch(config)# no lacp system-priority
```

A momentary traffic drop can be seen in case the LACP state machine must renegotiate.

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lag

```
lag <ID>
no lag <ID>
```

Description

Adds an interface to a specified LAG interface ID.

The **no** form of this command removes an interface from a specified LAG interface ID. The member loses its LACP configuration when removed from the LAG. The member also reaches the default state with an administrative shutdown. For 6300 and 6400 series switches, the administrative state is enabled. Configurations, such as MTU and UDLD, are retained.

Parameter	Description
<ID>	Specifies a LAG interface ID. Range: 1 to 256.

Usage

- All members of the LAG must have the same speed. If a member comes up late with a different speed, it will not participate in the LAG/LACP. The hardware restriction is applied before adding an interface to LAG. The member belongs to the card type that has the same maximum speed as the reference port card type.
- To move an interface from LagA to LagB, first remove the interface from LagA and then add it to LagB. When a member is attached to a LAG, the nondefault configurations on the member are removed silently.
- After removing a physical interface from a LAG, the interface associated with the LAG becomes L3 ports with default L3 configurations and administrative down. For example, suppose interface 1/1/1 was part of LAG 3 and you had administratively enabled the interface. If you later remove interface

1/1/1 from LAG 3, the administrative status automatically changes to down. If you want to use the interface again, you must administratively enable it again.

Examples

Adding an interface to a Link Aggregation Group (LAG) represented by an ID of 100:

```
switch(config)# interface 1/1/1
switch(config-if)# lag 100
```

Deleting an interface from a Link Aggregation Group (LAG) represented by an ID of 100:

```
switch(config)# interface 1/1/1
switch(config-if)# no lag 100
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

show interface

`show interfaces <LAG-NAME> [vsx-peer]`

Description

Displays information about a specific LAG.

Parameter	Description
<LAG-NAME>	Specifies a LAG name.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Displaying information about LAG 100:

```
switch# show interface lag100
Aggregate lag100 is up
 Admin state is up
 Description :
 MAC Address                 : 48:0f:cf:af:43:9c
 Aggregated-interfaces       : 1/1/2
 Aggregation-key             : 100
 Aggregate mode              : active
 Speed                       : 2000 Mb/s
 L3 Counters: Rx Disabled, Tx Disabled
 qos trust none
 VLAN Mode: access
 Access VLAN: 1

 Statistics                      RX                   TX                Total
 ------------- -------------------- -------------------- --------------------
 Packets                         20                   45                   65
   Unicast                        5                    5                   10
   Multicast                      5                   15                   20
   Broadcast                     10                   25                   35
 Bytes                         5658                 2584                 8242
 Jumbos                           0                    0                    0
 Dropped                          0                    0                    0
 Filtered                         0                    0                    0
 Pause Frames                     0                    0                    0
 Errors                           0                    0                    0
   CRC/FCS                        0                  n/a                    0
   Collision                    n/a                    0                    0
   Runts                          0                  n/a                    0
   Giants                         0                  n/a                    0
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lacp aggregates

```
show lacp aggregates [<LAG-NAME>] [vsx-peer]
```

Description

Displays all LACP aggregate information configured for all LAGs, or for a specific LAG.

Parameter	Description
<LAG-NAME>	Optional: Specifies a lag name.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Displaying LACP aggregate information configured for lag10:

```
switch# show lacp aggregates lag10

Aggregate-name         : lag10
Aggregated-interfaces : 1/1/1 1/1/2
Heartbeat rate         : slow
Hash                   : l3-src-dst
Aggregate mode         : active
```

Displaying LACP aggregates:

```
switch# show lacp aggregates

Aggregate-name         : lag1
Aggregated-interfaces : 1/1/27 1/1/28 1/1/29
Heartbeat rate         : slow
Hash                   : l3-src-dst
Aggregate mode         : active


Aggregate-name         : lag2
Aggregated-interfaces : 1/1/48
Heartbeat rate         : slow
Hash                   : l2-src-dst
Aggregate mode         : passive
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lacp configuration

`show lacp configuration [vsx-peer]`

Description

Displays global LACP configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Displaying global LACP configuration:

```
switch# show lacp configuration
System-id       : 98:f2:b3:68:40:a0
System-priority : 65534
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lacp interfaces

`show lacp interfaces [<IFNAME>] [vsx-peer]`

Description

Displays an LACP configuration of the physical interfaces, including VSXs. If an interface name is passed as argument, it only displays an LACP configuration of a specified interface.

Parameter	Description
<IFNAME>	Optional: Specifies an interface name.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

This example displays an LACP configuration of the physical interfaces. One of the interfaces has the **lacp-block** forwarding state. If a VSX switch has loop protect enabled on an interface and a loop occurs, VSX blocks the interface to stop the loop. The forwarding state of the blocked interface is set to **lacp-block**.

```
switch# show lacp interfaces
State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
----------------------------------------------------------------------------------
--
Intf   Aggr    Port    Port   State   System-id          System  Aggr Forwarding
       name    id      Pri                               Pri     Key  State
----------------------------------------------------------------------------------
--
1/1/1  lag10   17      1      ALFOE   70:72:cf:37:a3:5c  20      10   lacp-block
1/1/2  lag128  69      1      ALFNCD  70:72:cf:37:a3:5c  20      128  up
1/1/3  lag128  14      1      ALFNCD  70:72:cf:37:a3:5c  20      128  up
1/1/4  lag128                                                         down
1/1/5  lag20                                                          up

Partner details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggr    Partner Port     State     System-id       System   Aggr
       name    Port-id Pri                                Priority Key
------------------------------------------------------------------------------
1/1/1  lag10   0       65534    PLFOEX  00:00:00:00:00:00 65534    0
1/1/2  lag128  69      1        PLFNCD  70:72:cf:8c:60:a7 65534    128
1/1/3  lag128  14      1        PLFNCD  70:72:cf:8c:60:a7 65534    128
1/1/4  lag128
1/1/5  lag20
```

Displaying static LAG:

lacp fallback-staticcannot be configured on static lag. Attempts to configure **lacp fallback-static** on a static LAG results in the following message:
Cannot enable LACP-fallback static on static LAG.

```
switch# show lacp interfaces
State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
```

```
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggr   Port    Port   State   System-id         System  Aggr Forwarding
       Name   Id      Pri                              Pri     Key  State
------------------------------------------------------------------------------
1/1/1  lag10                                                        up
1/1/2  lag10                                                        up

Partner details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggr   Port    Port   State   System-id         System  Aggr
       Name   Id      Pri                              Pri     Key
------------------------------------------------------------------------------
1/1/1  lag10
1/1/2  lag10
```

Displaying an LACP configuration of the 1/1/1 interface:

```
switch# show lacp interfaces 1/1/1

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state


Aggregate-name : lag1
-------------------------------------------------
                       Actor            Partner
-------------------------------------------------
Port-id            | 28                 | 31
Port-priority      | 1                  | 1
Key                | 1                  | 1
State              | ALFNCD             | ALFNCD
System-id          | 98:f2:b3:68:40:a0  | 98:f2:b3:68:60:a6
System-priority    | 65534              | 65534
```

Displaying an LACP configuration after loop-protect is enabled on the primary VSX switch:

```
switch# show lacp interfaces

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr Forwarding
        Name       Id    Pri                             Pri    Key  State
------------------------------------------------------------------------------
1/4/14  lag1(mc)   206   1     ALFNCD   f8:60:f0:06:49:00 65534  1    up
1/5/15  lag2(mc)                                                     down
```

```
Partner details of all interfaces:
-------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr
        Name       Id    Pri                             Pri    Key
-------------------------------------------------------------------------------
1/4/14  lag1(mc)   130   1     ALFNCD  f8:60:f0:06:87:00 65534  1
1/5/15  lag2(mc)
```

Displaying an LACP configuration after loop-protect is enabled on the secondary VSX switch:

```
switch# show lacp interfaces

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
-------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr Forwarding
        Name       Id    Pri                             Pri    Key  State
-------------------------------------------------------------------------------
1/3/2   lag1(mc)   1130  1     ALFNCD  f8:60:f0:06:49:00 65534  1    up
1/9/3   lag2(mc)                                                     down


Partner details of all interfaces:
-------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr
        Name       Id    Pri                             Pri    Key
-------------------------------------------------------------------------------
1/3/2   lag1(mc)   131   1     ALFNCD  f8:60:f0:06:87:00 65534  1
1/9/3   lag2(mc)
```

Displaying an LACP configuration with LACP fallback:

```
switch# show lacp interfaces

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state
Actor details of all interfaces:
-----------------------------------------------------------------------------------
Intf       Aggr       Port  Port  State   System-ID         System Aggr Forwarding
           Name       Id    Pri                             Pri    Key  State
-----------------------------------------------------------------------------------
1/1/4      lag10      5     1     IE      ec:eb:b8:e4:29:00 65534  10   up
1/1/5      lag10      6     1     IE      ec:eb:b8:e4:29:00 65534  10   lacp-block
1/1/6      lag10      7     1     IE      ec:eb:b8:e4:29:00 65534  10   lacp-block
1/3/27     lag10      156   1     IE      ec:eb:b8:e4:29:00 65534  10   lacp-block
1/1/9      lag20(mc)  9     1     IE      ec:eb:b8:e4:29:00 65534  10   up
Partner details of all interfaces:
-----------------------------------------------------------------------------------
Intf       Aggr       Port  Port  State   System-ID         System Aggr
           Name       Id    Pri                             Pri    Key
```

```
--------------------------------------------------------------------------------
1/1/4      lag10      0     0     IE      00:00:00:00:00:00 0       0
1/1/5      lag10      0     0     IE      00:00:00:00:00:00 0       0
1/1/6      lag10      0     0     IE      00:00:00:00:00:00 0       0
1/3/27     lag10      0     0     IE      00:00:00:00:00:00 0       0
1/1/9      lag20(mc)  0     0     IE      00:00:00:00:00:00 0       0
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.11	LACP fallback-static added.
10.11	LACP fallback added on VSX-supported platforms.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lag

```
show  lag <LAG-ID>
```

Description

Displays the lag.

Parameter	Description
<LAG-ID>	Specifies the lag ID.

Examples

Displaying the lag.

```
switch# show lag

System-ID       : f4:03:43:80:4a:00
System-priority : 65534
Hash            : l3-src-dst
Aggregate lag1 is down
   Admin state is down
   Description :
```

```
   Type                        : normal
   Lacp Fallback               : n/a
   MAC Address                 : f4:03:43:80:4a:00
   Aggregated-interfaces       :
   Aggregation-key             : 1
   Aggregate mode              : static
   LACP rate                   : n/a
   Speed                       : 0 Mb/s
   Mode                        : routed

Aggregate lag128 is down
  Admin state is down
  Description :
  Type                        : normal
  Lacp Fallback               : n/a
  MAC Address                 : f4:03:43:80:4a:00
-- MORE --, next page: Space, next line: Enter, quit: q
```

Displaying the lag when `lacp fallback-static` is enabled.

```
switch# show lag

System-ID       : 90:20:c2:24:60:00
System-priority : 65534


Aggregate lag1 is up
   Admin state is up
   Description :
   Type                        : normal
   Lacp Fallback               : Enabled
   MAC Address                 : 90:20:c2:24:60:00
   Aggregated-interfaces       : 1/1/1 1/1/2 1/1/3 1/1/46 1/1/47 1/1/48
   Aggregation-key             : 1
   Aggregate mode              : active
   Hash                        : l3-src-dst
   LACP rate                   : slow
   Speed                       : 1000 Mb/s
   Mode                        : trunk
```

Release	Modification
10.11	LACP fallback-static added.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config interface lag

```
show running-config interface lag
```

Description

Displays the running configuration for interface lag.

Examples

Displaying the running configuration for interface lag.

```
switch# show running-config interface lag
interface lag 10 multi-chassis
   no shutdown
   no routing
   vlan trunk native 1
   vlan trunk allowed 10-12
   lacp mode active
   exit
interface lag 11 multi-chassis
   no shutdown
   no routing
   vlan trunk native 1
   vlan trunk allowed 10-12,2001
   lacp mode active
   exit
interface lag 256
   description VSX_ISL
   no shutdown
   no routing
   vlan trunk native 1 tag
   vlan trunk allowed all
   lacp mode active
   exit
```

Displaying the running configuration for interface lag with **lacp fallback-static** configured.

```
switch# show running-config interface lag
interface lag 1
   no shutdown
   no routing
   vlan trunk native 1
   vlan trunk allowed all
   lacp mode active
   lacp fallback-static
```

shutdown

```
shutdown
no shutdown
```

Description

Sets every interface in the LAG operationally down.

The **no** form of this command sets every interface operationally up.

Examples

Setting every interface in the LAG to shutdown:

```
switch(config)# interface lag 1
switch(config-lag-if)# shutdown
```

Resetting every interface in the LAG to the default (up):

```
switch(config)# interface lag 1
switch(config-lag-if)# no shutdown
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-lag-if`	Administrators or local user group members with execution rights for this command.

vlan trunk native

```
vlan trunk native <VLAN-ID>
no vlan trunk native [<VLAN-ID>]
```

Description

Assigns a native VLAN ID to a LAG interface.

The **no** form of this command removes a native VLAN from a LAG interface and assigns VLAN ID 1 as its native VLAN.

Parameter	Description
<VLAN-ID>	Specifies the number of the VLAN ID to assign. The VLAN ID must exist. Maximum number of VLANs supported: 4096 (6300, 6400) VLAN ID range: 2 to 4094.

Usage

By default, VLAN ID 1 is assigned as the LAG VLAN ID for all LAG interfaces. VLANs can only be assigned to a nonrouted (layer 2) interface or LAG interface.

Only one VLAN ID can be assigned as the native VLAN. For the interface to forward the native VLAN traffic, the interface has to be allowed explicitly by entering **vlan trunk allowed <ID>** where the ID is the native VLAN ID. This setting is also applicable to the physical interface.

Examples

Configuring a layer 2 dynamic aggregation group with native VLAN ID **1** assigned to LAG **1**:

For 6300, 6400, 8100, 8320, 8325, 8360, 8400, 9300, and 10000 switch series:

```
switch(config)# interface lag 1
switch(config-lag-if)# no shutdown
switch(config-lag-if)# no routing
switch(config-lag-if)# lacp mode active
switch(config-lag-if)# vlan trunk native 1
switch(config-lag-if)# vlan trunk allowed 1
```

Configuring a layer 2 dynamic aggregation group with native VLAN ID **20** assigned to LAG **1**:

For 6300, 6400, 8100, 8320, 8325, 8360, 8400, 9300, and 10000 switch series:

```
switch(config)# interface lag 1
switch(config-lag-if)# no shutdown
switch(config-lag-if)# no routing
switch(config-lag-if)# lacp mode active
switch(config-lag-if)# vlan trunk native 20
switch(config-lag-if)# vlan trunk allowed 20
```

Removing a native VLAN from LAG 1:

```
switch(config)# interface lag 1
switch(config-lag-if)# no vlan trunk native
```

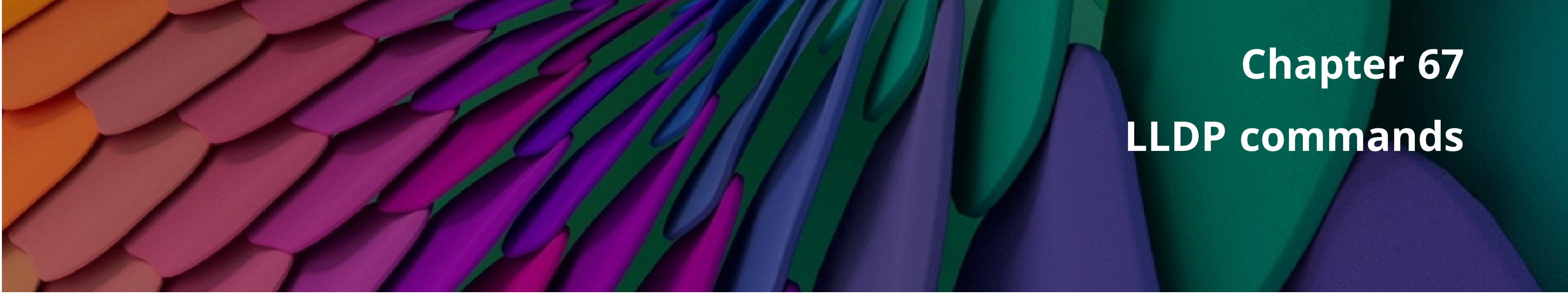
For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.



Chapter 67

LLDP commands

clear lldp neighbors

```
clear lldp neighbors
```

Description

Clears all LLDP neighbor details.

Examples

Clearing all LLDP neighbor details:

```
switch# clear lldp neighbors
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear lldp statistics

```
clear lldp statistics
```

Description

Clears all LLDP neighbor statistics.

Examples

Clearing all LLDP neighbor statistics:

```
switch# clear lldp statistics
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

lldp

```
lldp
no lldp
```

Description

Enables LLDP support globally on all active interfaces. By default, LLDP is enabled.

The **no** form of this command disables LLDP support globally on all active interfaces. It does not remove any LLDP configuration settings.

Examples

Enabling LLDP:

```
switch(config)# lldp
```

Disabling LLDP:

```
switch(config)# no lldp
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp dot3

```
lldp dot3 {poe | macphy}
no lldp dot3 {poe | macphy}
```

Description

Sets the 802.3 TLVs to be advertised. By default, advertisement of both POE and MAC/PHY TLVs is enabled. Not supported on the OOBM interface.

The **no** form of this command disables advertisement of 802.3 TLVs.

Parameter	Description
`poe`	Specifies advertisement of power over Ethernet data link classification.
`macphy`	Specifies advertisement of media access control and physical layer information.

Examples

Enabling advertisement of the POE TLV:

```
switch(config-if)# lldp dot3 poe
```

Disabling advertisement of the POE TLV:

```
switch(config-if)# no lldp dot3 poe
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

lldp dot3 eee

```
lldp dot3 eee
no lldp dot3 eee
```

Description

Sets the 802.3 TLVs for Energy-Efficient Ethernet (EEE) to be advertised. By default, advertisement of EEE TLVs is enabled. Not supported on the OOBM interface.

The **no** form of this command disables advertisement of 802.3 TLVs.

Parameter	Description
`eee`	Specifies advertisement of 802.3 TLVs for EEE.

Examples

Enabling advertisement of the EEE TLVs:

```
switch(config-if)# lldp dot3 eee
```

Disabling advertisement of the EEE TLVs:

```
switch(config-if)# no lldp dot3 eee
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

lldp dot3 mfs

```
lldp dot3 mfs
```

```
no lldp dot3 mfs
```

Description

Enables the 802.3 TLV list in LLDP to advertise for maximum frame size (MFS). Enabled by default.

The **no** form of this command disables the advertisement of maximum frame size TLVs.

Examples

Enabling advertisement of maximum frame size TLVs:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp dot3 mfs
```

Disabling advertisement of maximum frame size TLVs:

```
switch(config)# interface 1/1/1
switch(config-if)# no lldp dot3 mfs
```

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp holdtime-multiplier

```
lldp holdtime-multiplier <multiplier>
no lldp holdtime-multiplier
```

Description

Sets the holdtime TTL multiplier value that is used to calculate the LLDP Time-to-Live value. Time-to-Live defines the length of time that neighbors consider LLDP information sent by this agent as valid. When Time-to-Live expires, the information is deleted by the neighbor. Time-to-live is calculated by multiplying holdtime by the value of **lldp timer**.

The **no** form of this command sets the holdtime TTL multiplier to its default value of 4.

Parameter	Description
<multiplier>	Specifies the TTL multiplier in the range of 2 to 10. Default: 4.

Formula

TTL = Holdtime-multiplier x lldp timer

where:

TTL = Time-to-Live

Holdtime-multiplier = Multiplying holdtime value

lldp timer = Message transmission interval

Examples

Setting the holdtime to 8 times of the value of lldp timer:

```
switch(config)# lldp holdtime-multiplier 8
```

Setting the holdtime to the default value of 4 times of the value of lldp timer:

```
switch(config)# no lldp holdtime-multiplier
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp management-address vlan

```
lldp management-address vlan <VLAN-ID>
no lldp management-address vlan <VLAN-ID>
```

Description

Sets the VLAN whose IPv4 or IPv6 address is advertised as the LLDP management authority.

The **no** form of this command removes the VLAN whose IPv4 or IPv6 address is advertised as the LLDP management authority.

The following is the precedence for the management IP address TLV in the LLDP packet (in order):

- LLDP management-IP-address and management-ipv6-address, if configured.
- LLDP management VLAN's IPv4 and IPv6 address, if configured.
- Loopback IP address from the smallest configured loopback interface identifier.
- Route-only-port IP address (Layer-3 interface) or IP address of the SVI (Layer-2 interface).
- OOBM IP address.
- Base MAC address of the switch.

Parameter	Description
<VLAN-ID>	Specifies the VLAN ID.

Examples

Setting the management authority for VLAN 10:

```
switch(config)# lldp management-address vlan 10
```

Removing the management authority for VLAN 10:

```
switch(config)# no lldp management-address vlan 10
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp management-ip-address

```
lldp management-ip-address <IPV-ADDR>
no lldp management-ip-address
```

Description

Defines the IP management address of the switch which is sent in the management address TLV. One IPv4 and one IPv6 management address can be configured.

If you do not define an LLDP management address, then LLDP uses one of the following (in order):

- IP address of the port
- IP address of the management interface
- Base MAC address of the switch

The **no** form of this command removes the IPv4 management address of the switch.

Parameter	Description
<IPV4-ADDR>	Specifies the management address of the switch as an IPv4 format (**x.x.x.x**), where **x** is a decimal value from 0 to 255.

Examples

Setting the management address to **10.10.10.2**:

```
switch(config)# lldp management-ip-address 10.10.10.2
```

Removing the management address:

```
switch(config)# no lldp management-ip-address
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.14	The **management-ipv4-address** keyword is deprecated and replaced with **management-ip-address**.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp management-ipv6-address

```
lldp management-ipv6-address <IPV6-ADDR>
no lldp management-ipv6-address
```

Description

Defines the IPv6 management address of the switch. The management address is encapsulated in the management address TLV.

If you do not define an LLDP management address, then LLDP uses one of the following (in order):

- IP address of the port
- IP address of the management interface
- Base MAC address of the switch

The **no** form of this command removes the IPv6 management address of the switch.

Parameter	Description
<IPV6-ADDR>	Specifies an IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.

Examples

Setting the management address to 2001:db8:85a3::8a2e:370:7334:

```
switch(config)# lldp management-ipv6-address 2001:0db8:85a3::8a2e:0370:7334
```

Removing the management address:

```
switch(config)# no lldp management-ipv6-address
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp med

```
lldp med [poe [priority-override] | capability | network-policy]
no med [poe [priority-override] | capability | network-policy]
```

Description

Configures support for the LLDP-MED TLV. LLDP-MED (media endpoint devices) is an extension to LLDP developed by TIA to support interoperability between VoIP endpoint devices and other networking end-devices. The switch only sends the LLDP MED TLV after receiving a MED TLV from and connected endpoint device.

Not supported on the OOBM interface.

The **no** form of this command disables support for the LLDP MED TLV.

Parameter	Description
`poe [priority-override]`	Specifies advertisement of power over Ethernet data link classification. The **priority-override** option overrides user-configured port priority for Power over Ethernet. When both **lldp dot3 poe** and **lldp med poe** are enabled, the **lldp dot3 poe3** setting takes precedence. Default: enabled.
`capability`	Specifies advertisement of supported LLDP MED TLVs. The capability TLV is always sent with other MED TLVs, therefore it cannot be disabled when other MED TLVs are enabled. Default: enabled.
`network-policy`	Network policy discovery lets endpoints and network devices advertise their VLAN IDs, and IEEE 802.1p (PCP and DSCP) values for voice applications. This TLV is only sent when a voice VLAN policy is present. Default: enabled.

Examples

Enabling advertisement of the network policy TLV:

```
switch(config-if)# lldp med network-policy
```

Disabling advertisement of the network policy TLV:

```
switch(config-if)# no lldp med network-policy
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

lldp med location

```
lldp med location {civic-addr   elin-addr }
no med location {civic-addr  elin-addr }
```

Description

Configures support for the LLDP-MED TLV. Supports only civic address and emergency location information number (ELIN). Coordinate-based location is not supported.

The **no** form of this command disables support for the LLDP MED TLV.

Parameter	Description
`civic-addr`	Configures the LLDP MED civic location TLV.
`elin-addr`	Configures support for the LLDP MED emergency location TLV. This feature is intended for use in ECS applications to support class 3 LLDP-MED VoIP telephones connected to a switch in an MLTS infrastructure. An ELIN is a valid NANP format telephone number assigned to MLTS operators in North America by the appropriate authority. The ELIN is used to route emergency (E911) calls to a PSAP. (Range: 1-15 numeric characters)

The **lldp med location civic-addr** command requires a minimum of one type/value pair, but typically includes multiple type/value pairs as needed to configure a complete set of data describing a given location.

CA-TYPE: This is the first entry in a type/value pair and is a number defining the type of data contained in the second entry in the type/value pair (CA-VALUE.) Some examples of CA-TYPE specifiers include: 3=city 6=street (name) 25=building name (Range: 0 - 255)

CA-VALUE: This is the second entry in a type/value pair and is an alphanumeric string containing the location information corresponding to the immediately preceding CA-TYPE entry. Strings are delimited by either blank spaces, single quotes (' ... '), or double quotes ("... ".) Each string should represent a specific data type in a set of unique type/value pairs comprising the description of a location, and each string must be preceded by a CA-TYPE number identifying the type of data in the string.

The following LLDP-MED TLV values are supported. For details on these value types, refer to RFC 4776

- 1: national subdivisions (state, canton, region, province, prefecture)
- 2: county, parish, gun (JP), district (IN)
- 3: city, township, shi (JP)
- 4: city division, borough, city district, ward, chou (JP)
- 5: neighborhood, block
- 6: group of streets below the neighborhood level
- 16: leading street direction N
- 17: trailing street suffix SW
- 18: street suffix or type
- 19: house number
- 20: house number suffix
- 21: landmark or vanity
- 22: location
- 23: name
- 24: postal/zip code
- 25: building (structure)
- 26: unit (apartment, suite)

- 27: floor
- 28: room
- 29: type of place
- 30: postal community name
- 31: post office box
- 32: additional code 13203000003
- 33: seat (desk, cubicle workstation)
- 34: primary road name 35 road section
- 36: branch road name
- 37: sub-branch road name
- 38: street name pre-modifier
- 39: street name post-modifier

Examples

Enabling support for the LLDP MED emergency location TLV:

```
switch(config-if)# lldp med location elin-addr 408-555-1212
```

Disabling support for the LLDP MED emergency location TLV:

```
switch(config-if)# no lldp med location elin-addr 408-555-1212
```

Enabling support for the LLDP MED civic address TLV:

```
switch(config-if)# lldp med location civic-addr US 1 19 123 6 Fake 18 Street
```

Disabling support for the LLDP MED civic address TLV:

```
switch(config-if)# no lldp med location civic-addr US 1 19 123 6 Fake 18 Street
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

lldp receive

```
lldp receive
no lldp receive
```

Description

Enables reception of LLDP information on an interface. By default, LLDP reception is enabled on all active interfaces, including the OOBM interface.

The **no** form of this command disables reception of LLDP information on an interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling LLDP reception on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp receive
```

Disabling LLDP reception on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no lldp receive
```

Enabling LLDP reception on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# lldp receive
```

Disabling LLDP reception on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# no lldp receive
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

lldp reinit

```
lldp reinit <TIME>
no lldp reinit
```

Description

Sets the amount of time (in seconds) to wait before performing LLDP initialization on an interface.

The **no** form of this command sets the reinitialization time to its default value of 2 seconds.

Parameter	Description
<TIME>	Specifies the reinitialization time in seconds. Range: 1 to 10. Default: 2 seconds.

Examples

Setting the reinitialization time to 5 seconds:

```
switch(config)# lldp reinit 5
```

Setting the reinitialization time to the default value of 2 seconds:

```
switch(config)# no lldp reinit
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

lldp select-tlv

```
lldp select-tlv <TLV-NAME>
no lldp select-tlv <TLV-NAME>
```

Description

Selects a TLV that the LLDP agent will send and receive. By default, all supported TLVs are sent and received.

The **no** form of this command stops the LLDP agent from sending and receiving a specific TLV.

LLDP supports Organization Unique Identifiers (OUI) with the following Organization-specific TLVs:

- IEEE 802.1 (DOT1) (oui:0x00, 0x80, 0xc2)
- IEEE 802.3 (DOT3) (oui:0x00, 0x12, 0x0f)
- Aruba, a Hewlett Packard Enterprise Company (oui:0x88, 0x3a, 0x30)

Parameter	Description
`select-tlv` *`<TLV-NAME>`*	Specifies the TLV name to send. The following TLV names are supported: ■ **management-address:** Selection is based on priority in the following list (for example if first TLV name isn't selected, the next will be, progressing through this list until a selection is made): 1. IPv4 or IPV6 management address. 2. IP address of the lowest configured loopback interface. 3. If layer 3, then the route-only port IP address. If layer 2, the IP address of the SVI. 4. OOBM interface IP address. 5. Base MAC address of the switch. ■ **port-description:** Select port-description TLV. ■ **port-vlan-id:** Select port-vlan-id TLV. ■ **port-vlan-name:** Select port-vlan-name TLV. ■ **system-capabilities:** Select system-capabilities TLV. ■ **system-description:** Select system-description TLV. ■ **system-name:** Select system-name TLV.

Examples

Stopping the LLDP agent from sending the **port-description** TLV:

```
switch(config)# no lldp select-tlv port-description
```

Enabling the LLDP agent to send the **port-description** TLV:

```
switch(config)# lldp select-tlv oui
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp timer

```
lldp timer <TIME>
no lldp timer
```

Description

Sets the interval (in seconds) at which local LLDP information is updated and TLVs are sent to neighboring network devices by the LLDP agent. The minimum setting for this timer must be four times the value of **lldp txdelay**.

For example, this is a valid configuration:

- **lldp timer** = 16
- **lldp txdelay** = 4

And, this is an invalid configuration:

- **lldp timer** = 5
- **lldp txdelay** = 2

When copying a saved configuration to the running configuration, the value for **lldp timer** is applied before the value of **lldp txdelay**. This can result in a configuration error if the saved configuration has a value of **lldp timer** that is not four times the value of **lldp txdelay** in the running configuration.

For example, if the saved configuration has the settings:

- **lldp timer** = 16
- **lldp txdelay** = 4

And the running configuration has the settings:

- **lldp timer** = 30
- **lldp txdelay** = 7

Then you will see an error indicating that certain configuration settings could not be applied, and you will have to manually adjust the value of **lldp txdelay** in the running configuration.

The **no** form of this command sets the update interval to its default value of 30 seconds.

Parameter	Description
<TIME>	Specifies the update interval (in seconds). Range: 5 to 32768. Default: 30.

Examples

Setting the update interval to 7 seconds:

```
switch(config)# lldp timer 7
```

Setting the update interval to the default value of 30 seconds:

```
switch(config)# no lldp timer
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp transmit

```
lldp transmit
no lldp transmit
```

Description

Enables transmission of LLDP information on specific interface. By default, LLDP transmission is enabled on all active interfaces, including the OOBM interface.

The **no** form of this command disables transmission of LLDP information on an interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling LLDP transmission on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp transmit
```

Disabling LLDP transmission on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no lldp transmit
```

Enabling LLDP transmission on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# lldp transmit
```

Disabling LLDP transmission on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# no lldp transmit
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

lldp txdelay

```
lldp txdelay <TIME>
no lldp txdelay
```

Description

Sets the amount of time (in seconds) to wait before sending LLDP information from any interface. The maximum value for **txdelay** is 25% of the value of **lldp tx timer**.

The **no** form of this command sets the delay time to its default value of 2 seconds.

Parameter	Description
<TIME>	Specifies the delay time in seconds. Range: 0 to 10. Default: 2.

Examples

Setting the delay time to 8 seconds:

```
switch(config)# lldp txdelay 8
```

Setting the delay time to the default value of 2 seconds:

```
switch(config)# no lldp txdelay
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

lldp trap enable

```
lldp trap enable
no lldp trap enable
```

Description

Enables sending SNMP traps for LLDP related events from a particular interface. LLDP trap generation is enabled by default on all the interfaces and has to be disabled for interfaces on which traps are not required to be generated.

The **no** form of this command disables the LLDP trap generation.

LLDP trap generation is disabled by default at the global level and must be enabled before any LLDP traps are sent.

Examples

Enabling LLDP trap generation on global level:

```
switch(config)# lldp trap enable
```

Enabling LLDP trap generation on interface level:

```
switch(config-if)# lldp trap enable
```

Disabling LLDP trap generation on global level:

```
switch(config)# no lldp trap enable
```

Disabling LLDP trap generation on interface level:

```
switch(config-if)# no lldp trap enable
```

Displaying LLDP global configuration:

```
switch# show lldp configuration


LLDP Global Configuration
=========================
LLDP Enabled                 : No
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : No


TLVs Advertised
===============
Management Address
Port Description
Port VLAN-ID
System Description
System Name

LLDP Port Configuration
=======================
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
--------------------------------------------------------------------------
1/1/1          Yes                 Yes                 Yes
1/1/2          Yes                 Yes                 Yes
1/1/3          Yes                 Yes                 Yes
1/1/4          Yes                 Yes                 Yes
1/1/5          Yes                 Yes                 Yes
1/1/6          Yes                 Yes                 Yes
...........
...........
mgmt           Yes                 Yes                 Yes
```

Displaying LLDP Configuration for the interface:

```
switch# show lldp configuration 1/1/1

LLDP Global Configuration
=========================
LLDP Enabled                 : Yes
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : No


LLDP Port Configuration
=======================
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
----------------------------------------------------------------------------
1/1/1          Yes                 Yes                 Yes
```

Displaying LLDP Configuration for the management interface:

```
switch# show lldp configuration mgmt

LLDP Global Configuration
=========================
LLDP Enabled                : Yes
LLDP Transmit Interval      : 30
LLDP Hold Time Multiplier   : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval  : 2
LLDP Trap Enabled           : Yes


LLDP Port Configuration
=======================
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
----------------------------------------------------------------------------
mgmt           Yes                 Yes                 Yes
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` and `config-if`	Administrators or local user group members with execution rights for this command.

show lldp configuration

`show lldp configuration [<INTERFACE-ID>][vsx-peer]`

Description

Shows LLDP configuration settings for all interfaces or a specific interface.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: **member/slot/port**.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing configuration settings for all interfaces:

```
switch# show lldp configuration

LLDP Global Configuration
=========================
LLDP Enabled                 : No
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : No

TLVs Advertised
===============
Management Address
Port Description
Port VLAN-ID
System Description
System Name

LLDP Port Configuration
=======================
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
--------------------------------------------------------------------------
1/1/1          Yes                 Yes                 Yes
1/1/2          Yes                 Yes                 Yes
1/1/3          Yes                 Yes                 Yes
1/1/4          Yes                 Yes                 Yes
1/1/5          Yes                 Yes                 Yes
1/1/6          Yes                 Yes                 Yes
...........
...........
mgmt           Yes                 Yes                 Yes
```

This example shows configuration settings for interface **1/1/1**.

```
switch# show lldp configuration 1/1/1

LLDP Global Configuration
=========================
LLDP Enabled                 : Yes
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : No

LLDP Port Configuration
=======================
Auto Flush On Link Down      : Yes
Med Location Civic-addr      : US 1 4 ret 6 tyu 7 tiyuo
Med Location Elin-addr       : gher
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
---------------------------------------------------------------------------
1/1/1          Yes                 Yes                 Yes
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp configuration mgmt

```
show lldp configuration mgmt
```

Description

Shows LLDP configuration settings for the OOBM interface.

Example

Showing configuration settings for all interfaces:

```
switch# show lldp configuration mgmt

LLDP Global Configuration
=========================
LLDP Enabled                 : Yes
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : Yes


LLDP Port Configuration
```

```
========================
PORT            TX-ENABLED           RX-ENABLED           INTF-TRAP-ENABLED
------------------------------------------------------------------------------
mgmt            Yes                  Yes                  Yes
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp local-device

```
show lldp local-device[vsx-peer]
```

Description

Shows global LLDP information advertised by the switch, as well as port-based data. If VLANs are configured on any active interfaces, the VLAN ID is only shown for trunk native or untagged VLAN IDs on access interfaces.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing global LLDP information only (all ports including OOBM port are administratively down):

```
switch# show lldp local-device

Global Data
===========

Chassis-ID              : 1c:98:ec:e3:45:00
System Name             : switch
System Description      : Aruba JL375A 8400X XL.01.01.0001
```

```
Management Address     : 192.168.10.1
Capabilities Available : Bridge, Router
Capabilities Enabled   : Bridge, Router
TTL                    : 120
```

Showing all ports except **1/1/11** and OOBM as administratively down:

```
switch# show lldp local-device

Global Data
===========

Chassis-ID             : 1c:98:ec:e3:45:00
System Name            : switch
System Description     : Aruba
Management Address     : 192.168.10.1
Capabilities Available : Bridge, Router
Capabilities Enabled   : Bridge, Router
TTL                    : 120

Port Based Data
===============

Port-ID           : 1/1/11
Port-Desc         : "1/1/11"
Port Mgmt-Address : 164.254.21.220
Port VLAN ID      : 1

Port-ID           : mgmt
Port-Desc         : "mgmt"
Port Mgmt-Address : 164.254.21.220
```

In this example, all the ports except **1/1/11** are administratively down, and VLAN ID 100 is configured on this access interface.

```
switch# show lldp local-device

Global Data
===========

Chassis-ID             : 1c:98:ec:e3:45:00
System Name            : switch
System Description     : Aruba
Management Address     : 192.168.10.1
Capabilities Available : Bridge, Router
Capabilities Enabled   : Bridge, Router
TTL                    : 120

Port Based Data
===============

Port-ID           : 1/1/11
Port-Desc         : "1/1/11"
Port VLAN ID      : 100
Parent Interface  : interface 1/1/11
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp neighbor-info

```
show lldp neighbor-info [<INTERFACE-NAME>][vsx-peer]
```

Description

Displays information about neighboring devices for all interfaces or for a specific interface. The information displayed varies depending on the type of neighbor connected and the type of TLVs sent by the neighbor.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface for which to show information for neighboring devices. Use the format **member/slot/port** (for example, **1/3/1**).
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing LLDP information for all interfaces:

```
switch# show lldp neighbor-info

LLDP Neighbor Information
=========================

Total Neighbor Entries          : 3
Total Neighbor Entries Deleted  : 0
Total Neighbor Entries Dropped  : 0
Total Neighbor Entries Aged-Out : 0
```

```
LOCAL-PORT  CHASSIS-ID         PORT-ID       PORT-DESC     TTL      SYS-NAME
--------------------------------------------------------------------------------
1/1/1       70:72:cf:a4:7d:50  1/1/1         1/1/1         32       switch
1/1/2       48:0f:cf:af:73:80  1/1/2         1/1/2         120      switch
1/1/46      48:0f:cf:af:73:80  1/1/46        1/1/46        120      switch
mgmt        48:0f:cf:af:73:80  mgmt          mgmt          120      switch
```

Showing information for interface **1/3/1** when it has only one switch connected as a neighbor:

```
switch# show lldp neighbor-info 1/3/1

Port                             : 1/1/1
Neighbor Entries                 : 1
Neighbor Entries Deleted         : 0
Neighbor Entries Dropped         : 0
Neighbor Entries Aged-Out        : 0
Neighbor Chassis-Name            : HP-3800-24G-PoEP-2XG
Neighbor Chassis-Description     : HP J9587A 3800-24G-PoE+-2XG Switch, revision...
Neighbor Chassis-ID              : 10:60:4b:39:3e:80
Neighbor Management-Address      : 192.168.1.1
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled     : Bridge
Neighbor Port-ID                 : 1/1/1
Neighbor Port-Desc               : 1/1/1
Neighbor Port VLAN ID            : 1
Neighbor Port VLAN Name          : DEFAULT_VLAN_1
Neighbor Port MFS                : 1500
TTL                              : 120
```

Showing information for interface **1/3/10** when the neighbor sends a DOT3 power TLV:

```
switch# show lldp neighbor-info 1/3/10
Port                             : 1/3/10
Neighbor Entries                 : 1
Neighbor Entries Deleted         : 0
Neighbor Entries Dropped         : 0
Neighbor Entries Aged-Out        : 0
Neighbor Chassis-Name            : 84:d4:7e:ce:5d:68
Neighbor Chassis-Description     : ArubaOS (MODEL: 325), Version Aruba IAP
Neighbor Chassis-ID              : 84:d4:7e:ce:5d:68
Neighbor Management-Address      : 169.254.41.250
Chassis Capabilities Available : Bridge, WLAN
Chassis Capabilities Enabled     : WLAN
Neighbor Port-ID                 : 84:d4:7e:ce:5d:68
Neighbor Port-Desc               : eth0
TTL                              : 120
Neighbor Port VLAN ID            : 1
Neighbor Port VLAN Name          : DEFAULT_VLAN_1
Neighbor Port MFS                : 1500
Neighbor PoE information         : DOT3
Neighbor Power Type              : TYPE2 PD
Neighbor Power Priority          : Unkown
Neighbor Power Source            : Primary
PD Requested Power Value         : 25.0 W
PSE Allocated Power Value: 25.0 W
```

```
Neighbor Power Supported       : Yes
Neighbor Power Enabled         : Yes
Neighbor Power Class           : 5
Neighbor Power Paircontrol     : No
PSE Power Pairs                : Signal
```

Showing information for interface **1/1/1** when it has multiple neighbors (displays a maximum of four):

```
switch# show lldp neighbor-info 1/1/1

Port                           : 1/1/1
Neighbor Entries               : 4
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : switch
Neighbor Chassis-Description   : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID            : 1c:98:ec:fe:25:00
Neighbor Management-Address    : 10.1.1.2
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/1
Neighbor Port-Desc             : 1/1/1
Neighbor Port VLAN ID          : 1
Neighbor Port VLAN Name        : DEFAULT_VLAN_1
Neighbor Port MFS              : 1500
TTL                            : 120
Neighbor Chassis-Name          : switch
Neighbor Chassis-Description   : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID            : 1c:98:ec:fe:25:01
Neighbor Management-Address    : 10.1.1.3
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/1
Neighbor Port-Desc             : 1/1/1
Neighbor Port VLAN ID          : 1
Neighbor Port VLAN Name        : DEFAULT_VLAN_1
Neighbor Port MFS              : 1500
TTL                            : 120
Neighbor Chassis-Name          : switch
Neighbor Chassis-Description   : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID            : 1c:98:ec:fe:25:02
Neighbor Management-Address    : 10.1.1.4
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/1
Neighbor Port-Desc             : 1/1/1
Neighbor Port VLAN ID          : 50
Neighbor Port VLAN Name        : VLAN_50
Neighbor Port MFS              : 1500
TTL                            : 120
Neighbor Chassis-Name          : switch
Neighbor Chassis-Description   : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID            : 1c:98:ec:fe:25:03
Neighbor Management-Address    : 10.1.1.5
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/1
Neighbor Port-Desc             : 1/1/1
Neighbor Port VLAN ID            : 100
Neighbor Port VLAN Name          : VLAN_100
Neighbor Port MFS                : 1500
TTL                              : 120
```

Showing neighbor information for interface 1/3/2 when it has EEE enabled and successfully auto-negotiated:

```
switch# show lldp neighbor-info 1/3/2

Port                             : 1/3/2
Neighbor Entries                 : 1
Neighbor Entries Deleted         : 1
Neighbor Entries Dropped         : 0
Neighbor Entries Aged-Out        : 1
Neighbor Chassis-Name            : BLDG01-F1-6300
Neighbor Chassis-Description     : Aruba JL668A  FL.10.07.0001BN
Neighbor Chassis-ID              : 88:3a:30:92:a5:c0
Neighbor Management-Address      : 10.6.9.15
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID                 : 1/1/1
Neighbor Port-Desc               : 1/1/1
Neighbor Port VLAN ID            : 1
Neighbor Port VLAN Name          : DEFAULT_VLAN_1
Neighbor Port MFS                : 1500
TTL                              : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported      : true
Neighbor Auto-Neg Enabled        : true
Neighbor Auto-Neg Advertised     : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type                : 1000 BASETFD

Neighbor EEE information         : DOT3
Neighbor TX Wake time            : 17 us
Neighbor RX Wake time            : 17 us
Neighbor Fallback time           : 17 us
Neighbor TX Echo time            : 17 us
Neighbor RX Echo time            : 17 us
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp neighbor-info detail

```
show lldp neighbor-info detail [vsx-peer]
```

Description

Shows detailed LLDP neighbor information for all LLDP neighbor connected interfaces.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing detailed LLDP information for all interfaces:

```
switch# show lldp neighbor-info detail

LLDP Neighbor Information
=========================

Total Neighbor Entries          : 6
Total Neighbor Entries Deleted  : 2
Total Neighbor Entries Dropped  : 0
Total Neighbor Entries Aged-Out : 2

--------------------------------------------------------------------------------

Port                           : 1/1/1
Neighbor Entries               : 1
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : 6300
Neighbor Chassis-Description   : Aruba ...
Neighbor Chassis-ID            : 38:11:17:1a:d5:00
Neighbor Management-Address    : 38:11:17:1a:d5:00
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/4
Neighbor Port-Desc             : 1/1/4
Neighbor Port VLAN ID          : 1
Neighbor Port VLAN Name        : DEFAULT_VLAN_1
Neighbor Port MFS              : 1500
TTL                            : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported    : true
Neighbor Auto-Neg Enabled      : true
Neighbor Auto-Neg Advertised   : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type              : 1000 BASETFD

--------------------------------------------------------------------------------

Port                           : 1/1/2
Neighbor Entries               : 1
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : 6300
Neighbor Chassis-Description   : Aruba ...
Neighbor Chassis-ID            : 38:11:17:1a:d5:00
Neighbor Management-Address    : 38:11:17:1a:d5:00
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/5
Neighbor Port-Desc             : 1/1/5
Neighbor Port VLAN ID          : 1
Neighbor Port VLAN Name        : DEFAULT_VLAN_1
Neighbor Port MFS              : 1500
TTL                            : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported    : true
Neighbor Auto-Neg Enabled      : true
Neighbor Auto-Neg Advertised   : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type              : 1000 BASETFD

--------------------------------------------------------------------------------

Port                           : 1/1/3
Neighbor Entries               : 1
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : 6300
Neighbor Chassis-Description   : Aruba ...
Neighbor Chassis-ID            : 38:11:17:1a:d5:00
Neighbor Management-Address    : 38:11:17:1a:d5:00
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/6
Neighbor Port-Desc             : 1/1/6
Neighbor Port VLAN ID          : 1
Neighbor Port VLAN Name        : DEFAULT_VLAN_1
Neighbor Port MFS              : 1500
TTL                            : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported    : true
Neighbor Auto-Neg Enabled      : true
Neighbor Auto-Neg Advertised   : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type              : 1000 BASETFD

--------------------------------------------------------------------------------

Port                           : 1/1/46
Neighbor Entries               : 1
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : 6300
Neighbor Chassis-Description   : Aruba ...
Neighbor Chassis-ID            : 38:11:17:1a:d5:00
Neighbor Management-Address    : 38:11:17:1a:d5:00
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/19
Neighbor Port-Desc             : 1/1/19
Neighbor Port VLAN ID          : 1
Neighbor Port VLAN Name        : DEFAULT_VLAN_1
Neighbor Port MFS              : 1500
TTL                            : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported    : true
Neighbor Auto-Neg Enabled      : true
Neighbor Auto-Neg Advertised   : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type              : 1000 BASETFD

--------------------------------------------------------------------------------

Port                           : 1/1/47
Neighbor Entries               : 1
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : 6300
Neighbor Chassis-Description   : Aruba ...
Neighbor Chassis-ID            : 38:11:17:1a:d5:00
Neighbor Management-Address    : 38:11:17:1a:d5:00
Chassis Cap
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp neighbor-info mgmt

```
show lldp neighbor-info mgmt
```

Description

Displays information about neighboring devices connected to the OOBM interface.

Examples

Showing LLDP information for the OOBM interface:

```
switch# show lldp neighbor-info mgmt

Port                           : mgmt
Neighbor Entries               : 1
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : HP-3800-24G-PoEP-2XG
Neighbor Chassis-Description   : HP J9587A 3800-24G-PoE+-2XG Switch, revision...
Neighbor Chassis-ID            : 10:60:4b:39:3e:80
Neighbor Management-Address    : 192.168.1.1
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge
Neighbor Port-ID               : mgmt
Neighbor Port-Desc             : mgmt
TTL                            : 120
```

Showing LLDP information for the OOBM interface when there are four neighbors:

```
switch# show lldp neighbor-info mgmt

Port                           : mgmt
Neighbor Entries               : 4
Neighbor Entries Deleted       : 0
Neighbor Entries Dropped       : 0
Neighbor Entries Aged-Out      : 0
Neighbor Chassis-Name          : switch
Neighbor Chassis-Description   : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID            : 1c:98:ec:fe:25:00
Neighbor Management-Address    : 10.1.1.2
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/1
Neighbor Port-Desc             : 1/1/1
TTL                            : 120

Neighbor Chassis-Name          : switch
Neighbor Chassis-Description   : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID            : 1c:98:ec:fe:25:01
Neighbor Management-Address    : 10.1.1.3
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/1
Neighbor Port-Desc             : 1/1/1
TTL                            : 120

Neighbor Chassis-Name          : switch
Neighbor Chassis-Description   : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID            : 1c:98:ec:fe:25:02
Neighbor Management-Address    : 10.1.1.4
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled   : Bridge, Router
Neighbor Port-ID               : 1/1/1
Neighbor Port-Desc             : 1/1/1
TTL                            : 120
```

```
Neighbor Chassis-Name            : switch
Neighbor Chassis-Description     : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID              : 1c:98:ec:fe:25:03
Neighbor Management-Address      : 10.1.1.5
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled     : Bridge, Router
Neighbor Port-ID                 : 1/1/1
Neighbor Port-Desc               : 1/1/1
TTL                              : 120
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp statistics

`show lldp statistics [<INTERFACE-ID>][vsx-peer]`

Description

Shows global LLDP statistics or statistics for a specific interface.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: **member/slot/port**.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing global statistics for all interfaces:

~~~
switch# show lldp statistics
LLDP Global Statistics
======================

Total Packets Transmitted             : 19
Total Packets Received                : 19
Total Packets Received And Discarded : 0
Total TLVs Unrecognized               : 0

LLDP Port Statistics
====================

PORT-ID         TX-PACKETS      RX-PACKETS      RX-DISCARDED    TLVS-UNKNOWN
-----------------------------------------------------------------------------
1/1/1           7               7               0               0
1/1/2           7               7               0               0
1/1/3           0               0               0               0
1/1/4           0               0               0               0
1/1/5           0               0               0               0
...
mgmt            5               5               0               0

```
~~~

Showing statistics for interface **1/1/1**:

```
switch# show lldp statistics 1/1/1

LLDP Statistics
===============

Port Name                          : 1/1/1
Packets Transmitted                : 159
Packets Received                   : 163
Packets Received And Discarded     : 0
Packets Received And Unrecognized : 0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp statistics mgmt

`show lldp statistics mgmt`

Description

Shows LLDP statistics for the OOBM interface.

Example

Showing LLDP statistics for the OOBM interface:

```
switch# show lldp statistics mgmt

LLDP Statistics
===============

Port Name                          : mgmt
Packets Transmitted                : 20
Packets Received                   : 23
Packets Received And Discarded     : 0
Packets Received And Unrecognized  : 0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp tlv

`show lldp tlv[vsx-peer]`

Description

Shows the LLDP TLVs that are configured for send and receive.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show lldp tlv

TLVs Advertised
===============

Management Address
Port Description
Port VLAN-ID
System Capabilities
System Description
System Name
VLAN Name
MFS
OUI
```

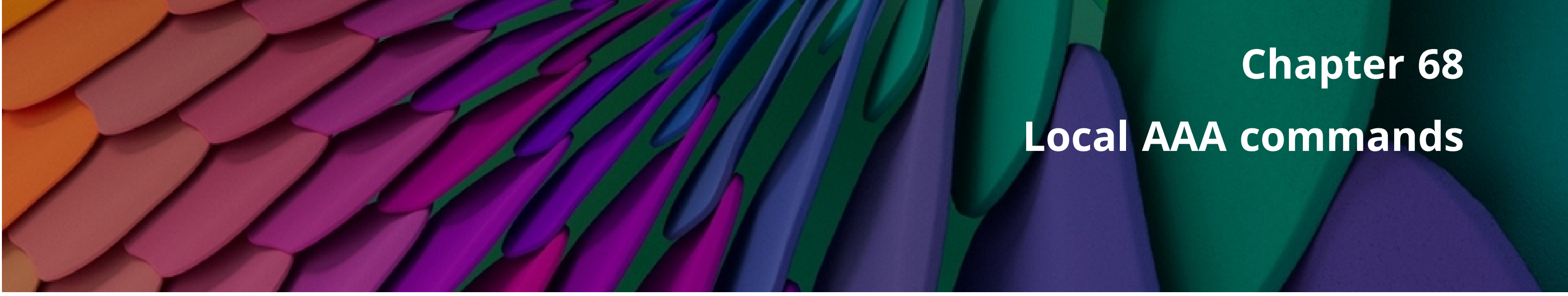
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 68

Local AAA commands

aaa accounting all-mgmt

```
aaa accounting all-mgmt <CONNECTION-TYPE> start-stop {local | group <GROUP-LIST>}
no aaa accounting all-mgmt <CONNECTION-TYPE>
```

Description

Defines accounting as being local (with the name **local**) (the default). Or defines a sequence of remote AAA server groups to be accessed for accounting purposes.

For remote accounting, the information is sent to the first reachable remote server that was configured with this command for remote accounting. If no remote server is reachable, local accounting remains available. Each available connection type (channel) can be configured individually as either local or using remote AAA server groups. All server groups named in your command, must exist. This command can be issued multiple times, once for each connection type. Local is always available for any connection type not configured for remote accounting.

> The system accounting log is not associated with any connection type (channel) and is therefore sent to the accounting method configured on the default connection type (channel) only.

The **no** form of this command removes for the specified connection type, any defined remote AAA server group accounting sequence. Local accounting is available for connection types without a configured remote AAA server group list (whether default or for the specific connection type).

Parameter	Description

<CONNECTION-TYPE>	One of these connection types (channels):
	`default`
	Defines a list of accounting server groups to be used for the **default** connection type. This configuration applies to all other connection types (**console**, **https-server**, **ssh**) that are not explicitly configured with this command. For example, if you do not use **aaa accounting all-mgmt console...** to define the console accounting list, then this default configuration is used for console.
	`console`
	Defines a list of accounting server groups to be used for the **console** connection type.
	`https-server`
	Defines a list of accounting server groups to be used for the **https-server** (REST, Web UI) connection type.
	`ssh`
	Defines a list of accounting server groups to be used for the **ssh** connection type.

`start-stop`	Selects accounting information capture at both the beginning and

Parameter	Description
	end of a process.
`local`	Selects local-only accounting when used without the **group** parameter.
`group` *`<GROUP-LIST>`*	Specifies the list of remote AAA server group names. Each name can be specified one time. Predefined remote AAA group names **tacacs** and **radius** are available. Although not a group name, predefined name **local** is available. User-defined TACACS+ and RADIUS server group names may also be used. The remote AAA server groups are accessed in the order that the group names are listed in this command. Within each group, the servers are accessed in the order in which the servers were added to the group. Server groups are defined using command **aaa group server** and servers are added to a server group with the command **server**. If the AAA server(s) in the group are not reachable, or the if there is a key mismatch error between the server and the switch, the next accounting method is attempted.

Usage

Local accounting is always active. It cannot be turned off.

Examples

Setting local accounting for the default connection type:

```
switch(config)# aaa accounting all-mgmt default start-stop local
```

Setting local accounting for the console connection type:

```
switch(config)# aaa accounting all-mgmt console start-stop local
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication console-login-attempts

```
aaa authentication console-login-attempts <ATTEMPTS> console-lockout-time <LOCKOUT-TIME>
no aaa authentication console-login-attempts
```

Description

For the console interface (channel) only, enables console login attempt limiting. If the number of failed console login attempts equals the configured threshold, the user is locked out for the configured duration.

The **no** form of this command disables console login attempt limits.

Important: If you enable the lockout using this command and also enable the SSH, REST, and Telnet lockout using command **aaa authentication limit-login-attempts**, and then enter too many consecutive wrong passwords, you may become locked out, and will have to wait for the configured lockout time to elapse before logging in on any interface.

This console login attempt limiting feature is only available when not using remote authentication through AAA servers (TACACS+ or RADIUS) on any interface. Remote authentication through AAA servers (TACACS+ or RADIUS) is not possible when limit login attempts is configured on any interface.

Parameter	Description
<ATTEMPTS>	Specifies the threshold of failed console login attempts that triggers user lockout. Range: 1 to 10. For example, if **<ATTEMPTS>** is set to **1**, a single failed login attempt triggers immediate user lockout.
<LOCKOUT-TIME>	Specifies the amount of time a user is locked out. Range: 1 to 3600 seconds.

Examples

Enabling console login attempt failure limiting with a 60 second lockout being triggered upon the third consecutive login attempt failure.

```
switch(config)# aaa authentication console-login-attempts 3 console-lockout-time
60
```

Disabling console login attempt failure limiting:

```
switch(config)# no aaa authentication console-login-attempts
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication limit-login-attempts

```
aaa authentication limit-login-attempts <ATTEMPTS> lockout-time <LOCKOUT-TIME>
no aaa authentication limit-login-attempts <ATTEMPTS> lockout-time <LOCKOUT-TIME>
```

Description

For the SSH, REST, and Telnet interface (channel), enables local login attempt limiting. If the number of failed local login attempts equals the configured threshold, the user is locked out for the configured duration.

The **no** form of this command disables local login attempt limits.

Important: If you enable the lockout using this command and also enable the console lockout using command **aaa authentication console-login-attempts**, and then enter too many consecutive wrong passwords, you may become locked out, and will have to wait for the configured lockout time to elapse before logging in on any interface.

This local login attempt limiting feature is only available when not using remote authentication through AAA servers (TACACS+ or RADIUS) on any interface. Remote authentication through AAA servers (TACACS+ or RADIUS) is not possible when limit login attempts is configured on any interface.

Parameter	Description
<ATTEMPTS>	Specifies the threshold of failed local login attempts that triggers user lockout. Range: 1 to 10. For example, if ***<ATTEMPTS>*** is set to **1**, a single failed login attempt triggers immediate user lockout.
<LOCKOUT-TIME>	Specifies the amount of time a user is locked out. Range: 1 to 3600 seconds.

Examples

Enabling local login attempt failure limiting with a 20 second lockout being triggered upon the fourth consecutive login attempt failure.

```
switch(config)# aaa authentication limit-login-attempts 4 lockout-time 20
```

Disabling login attempt failure limiting:

```
switch(config)# no aaa authentication limit-login-attempts
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Added Telnet lockout support on the 6200, 6300, 6400 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication login

```
aaa authentication login <CONNECTION-TYPE> {local | group <GROUP-LIST>}
no aaa authentication login <CONNECTION-TYPE> {local | group <GROUP-LIST>}
```

Description

Defines authentication as being local (with the name **local**) (the default). Or defines a sequence of remote AAA server groups to be accessed for authentication purposes. Each available connection type (channel) can be configured individually as either local or using remote AAA server groups. All server groups named in your command, must exist. This command can be issued multiple times, once for each connection type. Local is always available for any connection type not configured for remote AAA authentication.

The **no** form of this command removes for the specified connection type, any defined remote AAA server group authentication sequence. Local authentication is available for connection types without a configured remote AAA server group list (whether default or for the specific connection type).

Parameter	Description

<CONNECTION-TYPE>	One of these connection types (channels):
	`default`
	Defines a list of accounting server groups to be used for the `default` connection type. This configuration applies to all other connection types (`console`, `https-server`, `ssh`) that are not explicitly configured with this command. For example, if you do not use `aaa accounting all-mgmt console...` to define the console accounting list, then this default configuration is used for console.
	`console`
	Defines a list of accounting server groups to be used for the **console** connection type.
	`https-server`
	Defines a list of accounting server groups to be used for the **https-server** (REST, Web UI) connection type.
	`ssh`
	Defines a list of accounting server groups to be used for the **ssh** connection type.

Parameter	Description
`local`	Selects local-only accounting when used without the **group** parameter.
`group <GROUP-LIST>`	Specifies the list of remote AAA server group names. Each name can be specified one time. Predefined remote AAA group names **tacacs** and **radius** are available. Although not a group name, predefined name **local** is available. User-defined TACACS+ and RADIUS server group names may also be used. The remote AAA server groups are accessed in the order that the group names are listed in this command. Within each group, the servers are accessed in the order in which the servers were added to the group. Server groups are defined using command **aaa group server** and servers are added to a server group with the command **server**. If no AAA server(s) in the group are reachable, or if there is a key mismatch error between the server and the switch, the next authentication method is attempted.

Examples

Setting local authentication for the default connection type:

```
switch(config)# aaa authentication login default local
```

Setting local authentication for the console connection type:

```
switch(config)# aaa authentication login console local
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication minimum-password-length

```
aaa authentication minimum-password-length <LENGTH>
no aaa authentication minimum-password-length <LENGTH>
```

Description

Enables minimum password length checking. Existing passwords shorter than the minimum length are unaffected. Length checking does not apply to ciphertext passwords. Length checking applies both to local and remote authentication.

The **no** form of this command disables minimum password length checking.

Parameter	Description
<LENGTH>	Specifies the minimum password length. Range: 1 to 32.

Examples

Enabling password length checking, with a minimum length of 12.

```
switch(config)# aaa authentication minimum-password-length 12
```

Disabling minimum password length checking:

```
switch(config)# no aaa authentication minimum-password-length
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

aaa authorization commands (local)

```
aaa authorization commands <CONNECTION-TYPE> {local | none}
no aaa authorization commands <CONNECTION-TYPE> {local | none}
aaa authorization commands <CONNECTION-TYPE> group <GROUP-LIST>
no aaa authorization commands <CONNECTION-TYPE> group <GROUP-LIST>
```

Description

Defines authorization as being basic local RBAC (specified as **none**), or as full-fledged local RBAC specified as **local** (the default), or as remote TACACS+ (specified with `group` *<GROUP-LIST>*). Each available connection type (channel) can be configured individually. All server groups named in the command, must exist. This command can be issued multiple times, once for each connection type.

The **no** form of this command unconfigures authorization for the specified connection type, reverting to the default of **local**.

Although only TACACS+ servers are supported for remote authorization, local authorization (basic or full-fledged) can be used with remote RADIUS authentication. If your switch uses command authorization, best practices is to configure authorization fail-through before configuring authentication fail-through. If not, the switch may fall into an unusable state where authorization will fail for all commands.

Parameter	Description

<CONNECTION-TYPE>	One of these connection types (channels):
	`default`
	Selects the **default** connection type for configuration. This configuration applies to all other connection types (**console**, **ssh**) that are not explicitly configured with this command. For example, if you do not use **aaa authorization commands console...** to define the console authorization list, then this default configuration is used for console.
	`console`
	Selects the **console** connection type for configuration.
	`ssh`
	Selects the **ssh** connection type for configuration.

`local`	When used alone without `group` *<GROUP-LIST>*, selects local authorization which can be used to provide authorization for a purely local setup without any remote AAA servers and also for when RADIUS is used for remote Authentication and Accounting but Authorization is local. When used after `group`, provides for fallback (to full-fledged local authorization) when every server in every specified TACACS+ server group cannot be reached. **NOTE:** If any TACACS+ server in the specified groups is reachable, but the command fails to be authorized by that server, the command is rejected and local authorization is never attempted. Local authorization is only attempted if every TACACS+ server cannot be reached.
`none`	When used alone without `group` *<GROUP-LIST>*, selects basic local RBAC authorization, for use with the built-in user groups (**administrators**, **operators**, **auditors**). When used after `group`, provides for fallback (to basic local RBAC authorization) when every server in every specified TACACS+ server group cannot be reached. **NOTE:** With **none**, for users belonging to user-defined user groups, all commands can be executed regardless of what authorization rules are defined in such groups. For per-command local authorization, use **local** instead.
`group` *<GROUP-LIST>*	Specifies the list of remote AAA server group names. Predefined remote AAA group name **tacacs** is available. User-defined TACACS+ server group names may also be used. The remote AAA server groups are accessed in the order that the group names are listed in this command. Within each group, the servers are accessed in the order in which the servers were added to the group. Server groups are defined using command **aaa server group** and servers are added to a server group using command **server**. It is recommended to always include either the special name **local**

Parameter	Description
	or **none** as the last name in the group list. If both **local** or **none** are omitted, and no remote AAA server is reachable (or the first reachable server cannot authorize the command), command execution for the current user will not be possible. If no AAA server(s) in the group are reachable, or if there is a key mismatch error between the server and the switch, the next authorization method is attempted.

Examples

Setting the authorization for default to **local**:

```
switch(config)# aaa authorization commands default local
```

Setting the authorization for the SSH interface to **none**:

```
switch(config)# aaa authorization commands ssh none
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show aaa accounting

```
show aaa accounting [vsx-peer]
```

Description

Shows the accounting configuration per connection type (channel).

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Configuring and then showing local accounting for the default and console connection types:

```
switch(config)# aaa accounting all default start-stop local
switch(config)# aaa accounting all console start-stop local
switch(config)# exit
switch# show aaa accounting
AAA Accounting:
  Accounting Type                                : all
  Accounting Mode                                : start-stop

Accounting for default channel:
----------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
----------------------------------------------------------------------------------
local                             | 0
----------------------------------------------------------------------------------

Accounting for console channel:
----------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
----------------------------------------------------------------------------------
local                             | 0
----------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authentication

`show aaa authentication [vsx-peer]`

Description

Shows the authentication configuration per connection type (channel).

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Configuring and then showing local authentication for the default and console connection types (channels):

```
switch(config)# aaa authentication login default local
switch(config)# aaa authentication login console local
switch(config)# exit
switch# show aaa authentication

AAA Authentication:
  Fail-through                          : Disabled
  Limit Login Attempts                  : Not set
  Lockout Time                          : 300
  Minimum Password Length               : Not set

Authentication for default channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------

Authentication for console channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authorization

```
show aaa authorization [vsx-peer]
```

Description

Shows the authorization configuration per connection type (channel).

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Configuring and then showing full-fledged local RBAC authorization for the default and console connection types (channels):

```
switch(config)# aaa authorization commands default none
switch(config)#
switch(config)# aaa authorization commands console none
switch(config)# exit
switch#
switch# show aaa authorization
Authorization for default channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
none                             | 0
---------------------------------------------------------------------------------

Authorization for console channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
none                             | 0
---------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show authentication locked-out-users

`show authentication locked-out-users`

Description

Shows a list of users currently locked out due to excessive failed login attempts. This applies to console, REST, SSH, WebUI, and telnet logins.

Example

Showing locked-out users.

```
switch# show authentication locked-out-users
 USER                             GROUP
 ---------------------------------------
 admin                            administrators
 admin-1                          administrators
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	The output of this command now also includes information for users locked out due to excessive REST login attempts.
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show ssh authentication-method

```
show ssh authentication-method
```

Description

Shows the status of the SSH public key method and the local password-based (through SSH client) authentication method.

Example

Showing the authentication methods.

```
switch# show ssh authentication-method
SSH publickey authentication : Enabled
SSH password authentication : Enabled
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show user

`show user <USERNAME> authorized-key`

Description

Shows the SSH client public key list for a specified user.

Parameter	Description
<USERNAME>	Specifies the username for which you want to show the SSH client public key list.

Usage

Any user can show their own public key list; however, administrators can also show a public key list of other users.

Examples

Showing a client public key:

```
switch# show user admin authorized-key

1. Key Type : RSA      Key size : 2048
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDMtyMBmmAaF6r1zxf3DZNHSYVHBJhlbBlyAIqQ8DSHK
...
U+aE14UW/ifIukmK67sIHwK+FhhRYwPztQc5pjyOPk128a4pgKQaHCcOF169Z admin@switch
```

Showing two client public keys:

```
switch# show user admin authorized-key
1. Key Type : ECDSA     Curve : nistp256
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBEqEFevZ0
...
l76V+D0svdCJ9Wo32zqI9OeAdTJw/eZYp5qknhNgS81HjAI6J/4/kAqdZAjbqQUiCAk= admin@switch

2. Key Type : RSA      Key size : 2048
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDXQHrqV7+/GcMdOhr//IRjJkX7TQKupW89j80bL7xq8
...
j8qKuHWSN0/h/HxjzQJuYDVmZN5vG3DhpXbBZUlZNnchVod13QLCesqA3VLKN admin@switch
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ssh password-authentication

```
ssh password-authentication
```

```
no ssh password-authentication
```

Description

Enables the password-based authentication method for use with SSH clients.

The **no** form of this command disables the password-based authentication method for use with SSH clients.

Usage

The switch ships with password-based authentication (for SSH clients) enabled. The maximum number of password retries is three.

Examples

Enabling password authentication for use with SSH clients:

```
switch(config)# ssh password-authentication
```

Disabling password authentication for use with SSH clients:

```
switch(config)# no ssh password-authentication
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ssh public-key-authentication

```
ssh public-key-authentication
no ssh public-key-authentication
```

Description

Enables the SSH public key authentication method. The switch ships with SSH public key authentication enabled.

The **no** form of this command disables the SSH public key authentication method.

Although SSH public key authentication is enabled by default, it cannot be used until SSH public keys are added with the **user authorized-key** command.

Examples

Enabling SSH public key authentication:

```
switch(config)# ssh public-key-authentication
```

Disabling SSH public key authentication:

```
switch(config)# no ssh public-key-authentication
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

user authorized-key

```
user <USERNAME> authorized-key <PUBKEY>
no user <USERNAME> authorized-key [<KEYNUM>]
```

Description

Copies an SSH client public key into the key list. If the key list and the public key do not exist, it creates a list with the public key. If the SSH client public key exists, the command appends the new key to the existing list. The client public key list holds a maximum of 32 client keys.

The **no** form of the command removes either one or all SSH public keys from the key list.

Parameter	Description
<USERNAME>	Specifies the name of the user.
<PUBKEY>	Specifies the SSH client public key to be copied into the key list.
<KEYNUM>	Specifies the key number. The range is 1 to 32. Use the **show user *<USERNAME>* authorized-key** command to find the key number associated with the key.

Usage

Each key on the key list has a key identifier. The **show user <USERNAME> authorized-key** command displays the key identifier associated with the key.

Administrators can add and remove the public keys of themselves and other users. Operators can add and remove only their own public keys. If the public key authentication method is enabled, the client public key present is used by the SSH server to authenticate the client. The authentication method reverts to the password authentication method and prompts for a client password when one of the following occurs:

- The client public keys are not present.
- The server does not have the keys enabled.
- The public key method is disabled.

You can either remove all keys or a specific key. Each key on the key list has a key identifier. If you provide the key identifier in this command, the command removes the corresponding key from the list. If you provide no key identifier, the command removes all keys from the key list.

Examples

Adding a public key:

```
switch(config)#user admin authorized-key ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTIt
bmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBEqEFevZ0l76V+D0svdCJ9Wo32zqI9OeAIdTJwT/eZYp50qkA
nhZNgS81HBjAI6QJ/4/kAyqdZ9oAjbiqQUiCAk= root@switch
```

Removing all SSH public keys from the list:

```
switch(config)# no user admin authorized-key
```

Removing the specified SSH public key from the list:

```
switch(config)# no user admin authorized-key 2
```

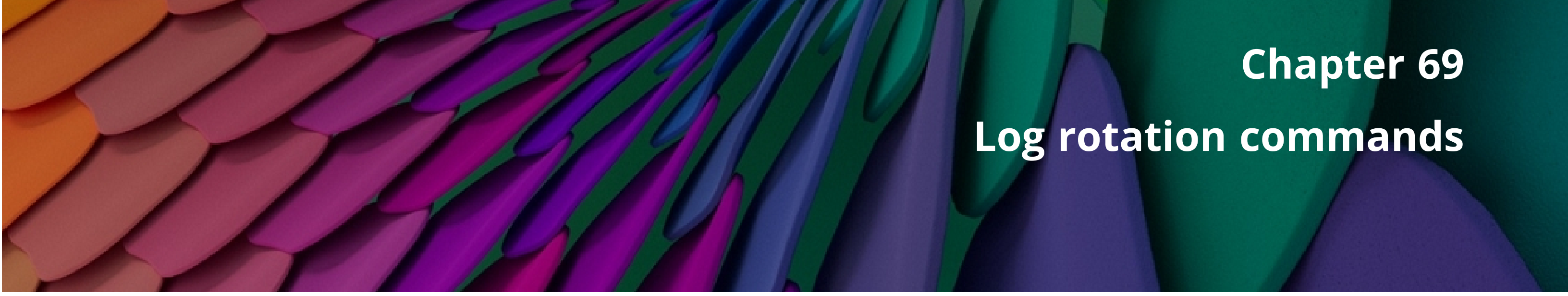
For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 69

Log rotation commands

logging threshold

```
logging threshold {audit-log | auth-log | commands-log |event-log | security-log | https-
server-log} <THRESHOLD%>
no logging threshold {audit-log | auth-log | commands-log | event-log |  security-log |
https-server-log} [<THRESHOLD%>]
```

Description

Selects the logging buffer notification threshold for the specified logging buffer. Whenever the logging buffer space consumption exceeds the selected threshold (percent of buffer capacity), a LOG_BUFFER_ALMOST_FULL event and SNMP RMON trap is triggered. This gives you the opportunity to save the logs elsewhere before the buffers are rotated with the oldest data being overwritten.

Also, a LOG_BUFFER_WRAPPED event and SNMP RMON trap is triggered if the logging buffer capacity is fully consumed and the log buffer is rotated with the oldest data being overwritten.

The **no** form of this command resets the logging buffer warning threshold to its default. All logs except **audit-log** have a default of 90 (percent) and **audit-log** has a default of 50 (percent).

The largest REST payload that can be sent to RADIUS/TACACS servers is 1024 characters, and the maximum REST payload that can be sent to syslog servers is 3500 characters. Once this limit is exceeded, the log will display three dots (...) to indicate the the message has exceeded the character limit and is incomplete. .

Parameter	Description
`audit-log`	Selects the audit log.
`auth-log`	Selects the authentication log.
`commands-log`	Configure the logging threshold for commands log buffer
`event-log`	Selects the event log.
`https-server-log`	Selects the HTTPS server log.
`security-log`	Selects the security log.
<THRESHOLD%>	Selects the notification threshold as a percent that the selected logging buffer is full. Available percent values for all logs except `audit-log`: **15 30 50 70 90 100** Available percent values for `audit-log`: **50 100**

Examples

Setting the audit log threshold:

```
switch(config)# logging threshold audit-log 100
```

Setting the authentication log threshold:

```
switch(config)# logging threshold auth-log 50
```

Setting the event log threshold:

```
switch(config)# logging threshold event-log 70
```

Setting the HTTPS server log threshold:

```
switch(config)# logging threshold https-server-log 50
```

Setting the security log threshold:

```
switch(config)# logging threshold security-log 70
```

Resetting the audit log threshold to its default of 50:

```
switch(config)# no logging threshold audit-log
```

Resetting the authentication log threshold to its default of 90:

```
switch(config)# no logging threshold auth-log
```

Resetting the event log threshold to its default of 90:

```
switch(config)# no logging threshold event-log
```

Resetting the HTTPS server log threshold to its default of 90:

```
switch(config)# no logging threshold https-server-log
```

Resetting the security log threshold to its default of 90:

```
switch(config)# no logging threshold security-log
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.11	Introduced the **commands-log** parameter.
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

logrotate maxsize

```
logrotate maxsize <MAX-SIZE>
no logrotate maxsize
```

Description

Specifies the maximum allowed log file size.

A log file that exceeds either the **logrotate maxsize** or the **logrotate period** (whichever happens first), triggers rotation of the log file.

The **no** form of this command resets the size of the log file to the default (100 MB).

Parameter	Description
<MAX-SIZE>	Specifies the allowed size the log file can reach before it is compressed and stored locally or transferred to a remote host. Range: 10 to 200 MB. Default: 100 MB.

Examples

Setting the maximum log file size:

```
switch(config)# logrotate maxsize 24
```

Resetting the maximum log file size to its default of 100 MB:

```
switch(config)# no logrotate maxsize
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

logrotate period

```
logrotate period {daily | hourly | monthly | weekly}
no logrotate period
```

Description

Sets the log file rotation time period. Defaults to daily.

A log file that exceeds either the **logrotate maxsize** or the **logrotate period** (whichever happens first), triggers rotation of the log file.

The **no** form of this command resets the log rotation period to the default of daily.

Parameter	Description
`daily`	Rotates log files on a daily basis (default) at 0:01.
`hourly`	Rotates log files every hour at the first second of the hour.
`monthly`	Rotates log files monthly on the first day of the month at 00:01.
`weekly`	Rotates log files once a week on Sunday at 00:01.

Examples

Setting a weekly period:

```
switch(config)# logrotate period weekly
```

Resetting the period to its default of daily:

```
switch(config)# no logrotate period
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

logrotate target

```
logrotate target <URI> [vrf <VRF_NAME>]
no logrotate target [<URI>] [vrf <VRF_NAME>]
```

Description

Using TFTP, sends the rotated log files to a specified remote host identified by Universal Resource Identifier (URI).

The **no** form of this command resets the target to the default, which stores the rotated and compressed log files locally in **/var/log/**.

Command context

Parameter	Description
`<URI>`	Specifies the URI of the remote host. The default directory is `local`. `tftp://{{<IPV4_ADDR>|IPV6_ADDR>}|HOST}[/<DIRECTORY>]`
`<VRF_NAME>`	Specifies the VRF name (Default: `default`).

Usage

- Rotated log files are compressed and stored locally in the path /var/log/ regardless of the remote host configuration.

Examples

Setting an IPv4 target:

```
switch(config)# logrotate target tftp://192.168.1.132
```

Setting an IPv4 target with a directory:

```
switch(config)# logrotate target tftp://192.168.1.132/logrotate/
```

Setting an IPv4 target with the default VRF:

```
switch(config)# logrotate target tftp://192.168.1.132 vrf mgmt
```

Setting an IPv6 target with the default VRF:

```
switch(config)# logrotate target tftp://2001:db8:0:1::128 vrf default
```

Resetting the target to local:

```
switch(config)# no logrotate target
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.09	Updated the syntax and examples.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show logrotate

`show logrotate [vsx-peer]`

Description

Shows the log rotate configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show logrotate
Logrotate configurations :
Period                : weekly
Maxsize               : 20MB
Target                : tftp://2001:db8:0:1::128 vrf mgmt
```

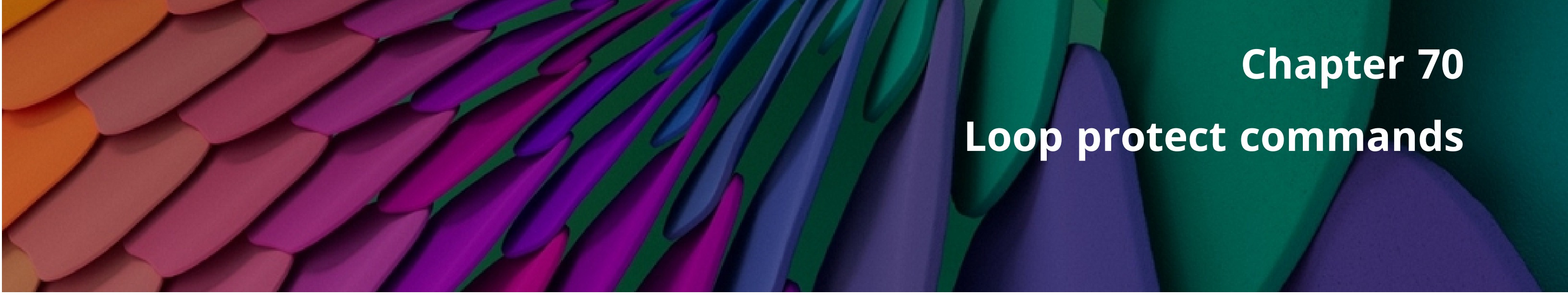
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 70

Loop protect commands

loop-protect

```
loop-protect
no loop-protect
```

Description

Enables loop protection on a layer 2 interface, VXLAN interface, or LAG. Loop protection packets are sent/received on the LAG and not the interface which are members of the LAG. Loop protection only works on layer 2 interfaces. If a layer 2 interface is changed to a layer 3 interface, all loop protection configuration settings are lost for that interface.

If loop protection is enabled on a VXLAN interface, the local VTEP will generate loop protect packets on the VXLAN tunnel. Remote VTEP will hardware forward the same loop protect packet. If a local VTEP receives its own packet on any L2 interface, it will be detected as a loop and will bring down the L2 interface on which the loop protect control packet was received.

The **no** form of this command disables loop protection on a layer 2 interface, VXLAN interface, or LAG.

> Loop protection on VXLAN interfaces is supported only on AOS-CX 6200,6300,6400,8360,8325,8400,9300,8100,10000 switch series.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling loop protection on interface **1/1/1**:

```
switch# config
switch(config)# interface 1/1/1
switch(config-if)# loop-protect
```

Enabling loop protection on LAG **25**:

```
switch# config
switch(config)# interface lag 25
switch(config-lag-if)# loop-protect
```

Enabling loop protection on VXLAN interface:

```
switch# config
switch(config)# interface vxlan 1
switch(config-vxlan-if)# loop-protect
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.12	Loop protection supported on VXLAN interfaces.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

All platforms	`config-if`
	`config-lag-if`
	`config-vxlan-if`
		Administrators or local user group members with execution rights for this command.

loop-protect action

```
loop-protect action {do-not-disable | tx-disable | tx-rx-disable}
no loop-protect action {do-not-disable | tx-disable | tx-rx-disable}
```

Description

Sets the action to be taken when a loop protection packet is received on a port.

If an action is configured after a loop is detected, then the new action only takes effect after the re-enable timer expires. To have the action take effect immediately, disable and then re-enable loop protect.

The **no** form of this command resets the action to the default (**tx-disable**).

This command is not supported on a VXLAN interface and the default action for a VXLAN interface is rx-disable .

Parameter	Description
`do-not-disable`	No ports are disabled. On every transmit interval, the loop will be detected and the detection will be reported via an SNMP trap and an event log message.
`tx-disable`	The port that transmitted the loop detection packet is disabled. When this setting is enabled, environments with N loops, must have loop protection be configured on at least N-1 ports to have a loop free topology. Default.
`tx-rx-disable`	The ports that transmitted and received the loop detection packet are disabled.

Example

```
switch(config-if)# loop-protect action do-not-disable
switch(config-if)# no loop-protect action do-not-disable
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

loop-protect re-enable-timer

```
loop-protect re-enable-timer <TIME>
no loop-protect re-enable-timer <TIME>
```

Description

Configures the time interval after which an interface disabled by loop protection is re-enabled. The loop protection timer is disabled by default.

The **no** form of this command disables the loop protect timer.

Parameter	Description
<TIME>	Specify the number of seconds after which a disabled interface is re-enabled. Range: 15 to 604800.

Example

```
switch# config
switch(config)# loop-protect re-enable-timer 60
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

loop-protect transmit-interval

```
loop-protect transmit-interval <TIME>
no loop-protect transmit-interval [<TIME>]
```

Description

Configures the time interval between successive loop protect packets sent on an interface.

The **no** form of this command sets the time interval to the default value of 5 seconds.

Parameter	Description
<TIME>	Configures the transmit interval in seconds. Range: 5 to 10. Default: 5.

Examples

```
switch(config)# loop-protect transmit-interval 10
switch(config)# no loop-protect transmit-interval
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

loop-protect trap loop-detected

```
loop-protect trap loop-detected
no loop-protect trap loop-detected
```

Description

Enables sending SNMP traps for loop-protect related events.

The **no** form of this command disables sending SNMP traps for loop-protect related events.

Examples

Enabling the sending of SNMP traps:

```
switch# loop-protect trap loop-detected
```

Disabling the sending of SNMP traps:

```
switch# no loop-protect trap loop-detected
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

loop-protect vlan

```
loop-protect vlan <VLAN-LIST>
no loop-protect vlan
```

Description

Specifies the trunk allowed VLANs on which loop protection packets are sent. By default, loop protection packets are only sent on access VLANs and native VLANs on a port. To send loop protection packets on trunk allowed VLANs, the VLANs must be explicitly added using this command.

When loop protection is enabled on VXLAN interfaces, the switch will start transmitting loop protect packets to each VTEP peer that are part of a VNI.

Loop protection can be configured on a maximum of 4094 VLANs across all interfaces.

Loop protection on VXLAN interfaces can be enabled on a maximum of 5000 (total of number of VTEPs * number of loop protect enabled VLANs). Loop protection will generate a maximum 5000 VXLAN encapsulated packets within the default loop protect time interval of 5 seconds.

The **no** form of this command removes loop protection from all VLANs on the interface.

Parameter	Description
<VLAN-LIST>	Specifies the number of a single VLAN, or a series of numbers for a range of VLANs, separated by commas (1, 2, 3, 4), dashes (1-4), or both (1-4, 6).

Example

```
switch(config-if)# loop-protect vlan 2-6,10,15-20
```

Enabling loop protection on VXLAN interface:

```
switch# config
switch(config)# interface vxlan 1
switch(config-lag-if)# loop-protect vlan 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.12	Loop protection supported on VXLAN interfaces.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-if config-vxlan-if	Administrators or local user group members with execution rights for this command.

show loop-protect

Description

`show loop-protect [<INTERFACE-NAME>] [vsx-peer]`

This command shows the following global configurations.

- Transmit interval.
- Re-enable timer.
- Per-port configurations.
- Loop-protect enable or disable status.
- Loop detection.

- Loop detected count.
- Timestamp of latest loop detection.
- Loop is detected on VLAN.
- Interface status.
- List of configured VLAN's for that port.
- VTEP port information

Specify the interface name on display for the filter. When rebooting the switch or after switchover, The loop-detected count on the loop detected port is reset to zero.

Parameter	Description
<INTERFACE-NAME>	Specifies the name of a logical interface on the switch. This can be one of the following: ■ An Ethernet interface associated with a physical port. Format: **member/slot/port**. ■ A LAG (link aggregation group). Specify the ID of LAG . For example: **lag100**. ■ A VXLAN interface. Specify the VXLAN ID. For example: **vxlan 1**.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Loop protection on VXLAN interfaces is supported on AOS-CX 6200, 6300, 6400, 8360, 8325, 8400, 9300, 8100, 10000 switch series.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# show loop-protect

Transmit Interval (sec)             : 5
Port Re-enable Timer (sec)          : Disabled
Loop Detected Trap                  : Enabled

Interface 1/1/1
  Loop-protect enabled          : Yes
  Loop-Protect enabled VLANs    :
  Action on loop detection      : TX disable
  Loop detected count           : 0
  Loop detected                 : No
  Interface status              : up

Interface 1/1/2
  Loop-protect enabled          : Yes
  Loop-Protect enabled VLANs    :
  Action on loop detection      : TX disable
  Loop detected count           : 0
  Loop detected                 : No
  Interface status              : up
Interface vxlan 1
```

```
 Loop-protect enabled         : Yes
 Loop-Protect enabled VLANs   :
 Action on loop detection     : RX disable
 Loop detected count          : 0
 Loop detected                : No
 Interface status             : up
```

```
switch# show loop-protect 1/1/3

Status and Counters - Loop Protection Information

Transmit Interval (sec)        : 5
Port Re-enable Timer (sec)     : 0
Loop Detected Trap             : Disabled

Interface 1
  Loop-protect enabled         : Yes
  Loop-Protect enabled VLANs   :
  Action on loop detection     : TX disable
  Loop detected count          : 0
  Loop detected                : No
  Interface status             : up
```

```
switch# show loop-protect
Status and Counters - Loop Protection Information


 Transmit Interval              : 5 (sec)
 Port Re-enable Timer           : Disabled
 Loop Detected Trap             : Disabled

 Interface 1/5/48
   Loop-protect enabled         : No
   Action on loop detection     : TX disable
   Loop detected count          : 1
   Loop detected                : Yes
   Detected on VLAN           : 100
   Detected at                : 2023-03-20T00:01:17
   Interface status             : down
   Tx_port                      : VTEP_100.1.1.2


  Interface vxlan1
   Loop-protect enabled         : Yes
   Loop-Protect enabled VLANs   : 100
   Action on loop detection     : RX disable
   Loop detected count          : 0
   Loop detected                : No
   Interface status             : up
```

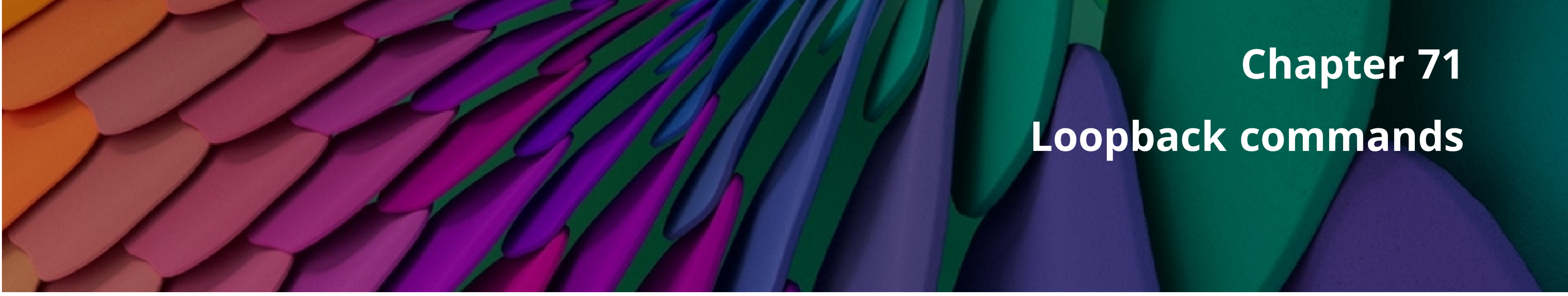
For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.12	Loop protection supported on VXLAN interfaces.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 71

Loopback commands

interface loopback

```
interface loopback <INSTANCE>
no interface loopback <INSTANCE>
```

Description

Creates a loopback interface and enters loopback configuration mode.

The **no** form of this command deletes a loopback interface.

Parameter	Description
<INSTANCE>	Selects the loopback interface ID. Range: 0 to 255

Examples

```
switch(config)# interface loopback
switch(config-loopback-if)#
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip address

```
ip address <IPV4-ADDR/MASK> [secondary]
no ip address <IPV4-ADDR/MASK> [secondary]
```

Description

Sets the IPv4 address for a loopback interface.

The **no** form of this command reverses the set of the IPv4 address for a loopback interface.

Parameter	Description
<IPV4-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
secondary	Indicates that the IPv4 address is a secondary address.

Examples

```
switch(config)# interface loopback 1
switch(config-loopback-if)# ip address 16.93.50.2/24
switch(config-loopback-if)# ip address 20.1.1.1/24 secondary
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ipv6 address

ipv6 address *<IPV6-ADDR/MASK>*

Description

Sets the IPv6 address for a loopback interface.

Parameter	Description
<IPV6-ADDR>	Specifies an IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.

Examples

switch(config)# **interface loopback 1**

switch(config-loopback-if)# **ipv6 address fd00:5708::f02d:4df6/64**

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

vrf attach

```
vrf attach <VRF-NAME>
no vrf attach <VRF-NAME>
```

Description

Attaches a non-default VRF to a loopback.

The **no** form of this command deletes a non-default VRF from a loopback and reattaches the default VRF.

Parameter	Description
<VRF-NAME>	Specifies the name of the non-default VRF to be attached/deleted to/from a loopback.

Examples

```
switch(config)# interface loopback 1
switch(config-loopback-if)#vrf attach test
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show interface loopback

```
show interface loopback [brief | instance <ID>] [vsx-peer]
```

Description

This command displays the configuration and status of loopback interfaces.

Parameter	Description
`brief`	Displays brief information about all configured loopback interfaces.
`instance <ID>`	Displays the configuration and status of a loopback interface ID. Range: 1-255
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show interface loopback
 Interface loopback1 is up
 IPv4 address 192.168.1.1/24
 Interface loopback2 is up
 IPv4 address 182.168.1.1/24
```

```
switch# show interface loopback brief
----------------------------------------------------------------------
Loopback      IP Address                                     Status
Interface
----------------------------------------------------------------------
loopback1   10.1.1.1/24                                         up
loopback1   1111:2222:3333:4444::6666/128                       up
```

```
switch# show interface loopback 1
 Interface loopback1 is up
 IPv4 address 192.168.1.1/24
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 72

MAC address table commands

clear mac-address

```
clear mac-address {interface <INTERFACE> | port <PORT-NUM> [vlan <VLAN-ID>] | vlan <VLAN-
ID> [port <PORT-NUM>] | <MAC-ADDR> [vlan <VLAN-ID>] [force]| <mac-address mac-move
[address <mac-address> vlan <vlan>] | [vlan <VLAN>]
<VLAN-ID>]}
```

Description

Clears the dynamic learned MAC addresses on the specified interface, combination of interface and VLAN, port, VLAN, combination of port and VLAN, MAC address, or combination of MAC address and VLAN. The command does not clear any port-security learned MAC addresses.

Port-security MAC addresses are cleared when the port on which the MAC addresses were learned are shut down or the port-access-security feature is disabled on the port or the switch.

Parameter	Description
<INTERFACE>	Specifies the list of interfaces, for example, **1/1/1** or **1/1/1-1/1/3** or **lag1** or **vxlan1**.
<PORT-NUM>	Specifies a physical port on the switch. Format: **member/slot/port**.
<VLAN-ID>	Specifies the number of a VLAN.
<MAC-ADDR>	Specifies the MAC address.
<mac-address mac-move>	Clears the MAC move count and move history for a specified list or range of VLANs, or for a specific MAC address and VLANs. When the MAC address and VLANs are not mentioned, the statistics for all MAC addresses are cleared.
force	Clears the specified MAC address even if the MAC address is internally programmed by MAC management.

Examples

On the 6400 Switch Series, interface identification differs.

Clearing the learned MAC addresses on a port:

```
switch# clear mac-address port 1/1/1
```

Clearing the learned MAC addresses on a combination of a VLAN and a port:

```
switch# clear mac-address port 1/1/1 vlan 20
```

```
switch# clear mac-address vlan 2 port 1/1/3
```

Clearing the learned MAC addresses on a combination of a VLAN and an interface or a list of interfaces:

```
switch# clear mac-address interface 1/1/1 vlan 10
```

```
switch# clear mac-address vlan 1 interface 1/1/1-1/1/3
```

Clearing the specified MAC addresses entry on the VLAN:

```
switch# clear mac-address 14:FA:01:F1:8B:8F vlan 1
```

Clearing the specified MAC addresses entry by force:

```
switch# clear mac-address 14:FA:01:F1:8B:8F force
```

Clearing the learned MAC move addresses on a port:

```
switch# clear mac-address mac-move
```

Clearing the learned MAC move addresses on a combination of a VLAN and an interface or a list of interfaces:

```
switch# clear mac-address mac-move address 00:00:00:00:00:01 vlan 10
```

Clearing the MAC move addresses entries on the VLAN:

```
switch# clear mac-address mac-move vlan 10-20
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.13	The **mac-address mac-move** parameter was introduced.
10.09	Added parameters for interface and MAC address.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

clear mac address mac move

```
clear mac-address mac-move [address <mac-address> vlan <vlan>] | [vlan <VLAN>]
```

Description

Clears the MAC move count and move history for a specified list or range of VLANs, or for a specific MAC and VLAN.
When MAC and VLAN are not mentioned, it clears statistics for all MACs.

Parameter	Description
<address>	Clears information for a specific MAC address.
<vlan>	Clears mac-move entries on VLANs.

Examples

Clearing the learned MAC move addresses on a port:

```
switch# clear mac-address mac-move
```

Clearing the learned MAC move addresses on a combination of a VLAN and an interface or a list of interfaces:

```
switch# clear mac-address mac-move address 00:00:00:00:00:01 vlan 10
```

Clearing the MAC move addresses entries on the VLAN:

```
switch# clear mac-address mac-move vlan 10-20
```

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

clear mac-address-table

```
clear mac-address-table
   address <mac-address>
   vlan <1-4094>
```

Description

This command is used to clear the MAC move count and move history for a single MAC address or VLAN, or for a range of VLANs. If no specific MAC address or VLAN is specified, this command clears statistics for all MAC addresses.

Parameter	Description
`address`	(Optional) Clear information for a specific MAC address.
`vlan <1-4094>`	(Optional) Clear move information for specific VLAN.

Examples

Clearing MAC move statistics for all MAC addresses.

```
switch# clear mac-address mac-move
```

Clearing MAC move statistics for MAC addresses in a range of VLANs.

```
switch# clear mac-address mac-move vlan 10-20
```

Clearing MAC move addresses from a specific MAC address and VLAN:

```
switch# clear mac-address mac-move address 00:00:00:00:00:01 vlan 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.13 or earlier	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

mac-address-table age-time

```
mac-address-table age-time <SECONDS>
no mac-address-table age-time [<SECONDS>]
```

Description

Sets the maximum amount of time a MAC address remains in the MAC address table. When this time expires, the MAC address is removed.

The **no** form of this command resets the MAC aging timer to the default value (300 seconds).

Parameter	Description
`age-time <SECONDS>`	Specifies the MAC address aging time in seconds. Range: 60 to 3600. Default: 300.

Example

```
switch(config)# mac-address-table age-time 120
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

mac-lockout

```
mac-lockout <MAC-ADDR>
no mac-lockout <MAC-ADDR>
```

Description

Locks a MAC address globally on the switch and all VLANS. The switch drops all data packets addressed to or from the given address.

The **no** form of this command unlocks the MAC address globally on the switch and all VLANs.

This configuration will disable flow tracking statistics collection.

Parameter	Description
<MAC-ADDR>	Specifies the MAC address.

Usage

MAC lockout is implemented on each switch individually. MAC lockout overrides MAC lockdown, port security (secure MAC), and 802.1X authentication. The MAC lockout feature is not intended to lock broadcast/multicast MAC addresses and switch agent MACs.

A maximum of 200 MAC lockouts can be configured on a switch.

Example

Enabling MAC lockout:

```
switch(config)# mac-lockout 00:00:00:00:00:01
```

Disabling MAC lockout:

```
switch(config)# no mac-lockout 00:00:00:00:00:01
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.14	Added information related to role based IPFIX.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400 (v2 profile only)	`config`	Administrators or local user group members with execution rights for this command.

show mac-address-table

```
show mac-address-table [hsc] [vsx-peer]
```

Description

Shows MAC address table information. If HSC is enabled, MAC addresses discovered by the HSC manager are also displayed.

Parameter	Description
`[hsc]`	Displays only MAC address discovered by the HSC manager on the remote controller.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing output when table entries exist:

```
switch# show mac-address-table
MAC age-time              : 300 seconds
Number of MAC addresses : 5

MAC Address          VLAN     Type       Port
--------------------------------------------------
00:00:00:00:00:05    1        dynamic    1/1/2
00:00:00:00:00:06    2        dynamic    1/1/1
00:00:00:00:00:08    3        hsc        vxlan1(10.1.1.1)
00:00:00:00:00:12    3        hsc        vxlan1(10.1.1.3)
00:00:00:00:00:34    3        hsc        vxlan1(10.1.1.4)
```

Showing output that includes information about an IPv6 VXLAN:

```
3C-T-6300-27# show mac-address-table
MAC age-time              : 300 seconds
Number of MAC addresses : 2
MAC Address          VLAN     Type                          Port
--------------------------------------------------------------
00:50:56:8d:44:13    1001     dynamic                       1/1/2
00:50:56:8d:45:63    1002     evpn                          vxlan1(1920:1680:1:1::2)
```

Showing output when there are no MAC table entries:

```
switch# show mac-address-table
No MAC entries found.
```

Showing only MAC address discovered by the HSC manager:

```
switch# show mac-address-table hsc
Number of MAC addresses : 3
MAC Address          VLAN     Type       Port
---------------------------------------------------------
00:00:00:00:00:08    3        hsc        vxlan1(10.1.1.1)
00:00:00:00:00:12    3        hsc        vxlan1(10.1.1.3)
00:00:00:00:00:34    3        hsc        vxlan1(10.1.1.4)
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table address

`show mac-address-table address <MAC-ADDR> [vsx-peer]`

Description

Shows MAC address table information for a specific MAC address.

Parameter	Description
<MAC-ADDR>	Specifies the MAC address.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

```
switch# show mac-address-table address 00:00:00:00:00:01
MAC age-time            : 300 seconds
Number of MAC addresses : 2

MAC Address          VLAN     Type       Port
--------------------------------------------------
00:00:00:00:00:01    2        dynamic    1/1/1
00:00:00:00:00:01    1        dynamic    1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table count

```
show mac-address-table count
      [dynamic | port <PORT-NUM> | vlan <VLAN-ID>] [vsx-peer]
```

Description

Displays the number of MAC addresses.

Parameter	Description
dynamic	Show the count of dynamically learned MAC addresses.
<PORT-NUM>	Specifies a physical port on the switch. Format: **member/slot/port**.
vlan *<VLAN-ID>*	Specifies the number of a VLAN.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing the number of MAC addresses:

```
switch# show mac-address-table count
Number of MAC addresses : 8
```

Showing the number of dynamically learned MAC addresses:

```
switch# show mac-address-table count dynamic
Number of MAC addresses : 8
```

Showing the number of MAC addresses per physical port on the switch:

```
switch# show mac-address-table count port 1/1/1
Number of MAC addresses : 2
```

Showing the number of MAC addresses per VLAN:

```
switch# show mac-address-table count vlan 100
Number of MAC addresses : 5
```

Showing the number of MAC addresses on the VSX primary and secondary (peer) switch:

```
vsx-primary# show mac-address-table count
Number of MAC addresses : 26114
vsx-primary# show mac-address-table count vsx-peer
Number of MAC addresses : 26113
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table dynamic

`show mac-address-table dynamic [port <PORT-NUM> | vlan <VLAN-ID>] [vsx-peer]`

Description

Shows MAC address table information about dynamically learned MAC addresses.

Parameter	Description
<PORT-NUM>	Specifies a physical port on the switch. Format: **member/slot/port**.
<VLAN-ID>	Specifies the number of a VLAN.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing all dynamic MAC address table entries:

```
switch# show mac-address-table dynamic
MAC age-time             : 300 seconds
Number of MAC addresses : 2

MAC Address          VLAN     Type       Port
--------------------------------------------------
00:00:00:00:00:05    1        dynamic    1/1/2
00:00:00:00:00:06    2        dynamic    1/1/1
```

Showing dynamic MAC address table entries for VLAN 1:

```
switch# show mac-address-table dynamic vlan 1
MAC age-time             : 300 seconds
Number of MAC addresses : 1

MAC Address          VLAN     Type       Port
--------------------------------------------------
00:00:00:00:00:05    1        dynamic    1/1/2
```

Showing dynamic MAC address table entries for port **1/1/1**:

```
switch# show mac-address-table dynamic port 1/1/1
MAC age-time             : 300 seconds
Number of MAC addresses : 1

MAC Address          VLAN     Type       Port
--------------------------------------------------
00:00:00:00:00:06    2        dynamic    1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table interface

`show mac-address-table interface <INTERFACE>`

Description

Shows the MAC address table entries for the specified interface.

Parameter	Description
<INTERFACE>	Specifies an interface or a list of interfaces on the switch.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the MAC address table entries for interface **1/1/1**:

```
switch# show mac-address-table interface 1/1/1
MAC age-time            : 300 seconds
Number of MAC addresses : 1

MAC Address          VLAN     Type       Interface
--------------------------------------------------
00:00:00:00:00:01    2        dynamic    1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table lockout

`show mac-address-table lockout [vsx-peer]`

Description

Shows MAC lockout table information.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show mac-address-table lockout
Number of MAC lockout addresses :

2MAC Address          Type
------------------------------------------
00:00:00:00:01:10    static
00:00:00:00:10:03    static
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac address table mac move

```
show mac-address-table mac-move [address <mac-address> vlan <vlan>] | [vlan <vlan>]
```

Description

Displays the MAC entries in the MAC address table that have moved at least once.

The output can be filtered based on a specific VLAN or specific MAC address and VLAN.

Parameter	Description
<address>	Displays information for a specific MAC address.
<vlan>	Displays information for specific VLANs.

Examples

Displaying the moved MAC addresses:

```
switch# show mac-address-table mac-move
Number of MAC addresses : 2

MAC Address        VLAN   Current Port    Previous Port   Move Count   Last Move
----------------------------------------------------------------------------------
```

```
-------------
00:00:00:00:00:bb  10     1/1/28          1/1/27          2            Fri Sep 15
19:11:52 2023
00:00:00:00:00:aa  10     1/1/27          1/1/28          2            Fri Sep 15
19:11:51 2023

switch# show mac-address-table mac-move address 00:00:00:00:00:aa vlan 10
Number of MAC Move addresses : 1

MAC Address        VLAN   Current Port    Previous Port   Move Count   Last Move
----------------------------------------------------------------------------------
------------
00:00:00:00:00:aa  10     1/1/27          1/1/28          2            Fri Sep 15
19:11:51 2023


switch# show mac-address-table mac-move vlan 10
Number of MAC Move addresses : 2

MAC Address        VLAN   Current Port    Previous Port   Move Count   Last Move
----------------------------------------------------------------------------------
------------
00:00:00:00:00:bb  10     1/1/28          1/1/27          2            Fri Sep 15
19:11:52 2023
00:00:00:00:00:aa  10     1/1/27          1/1/28          2            Fri Sep 15
19:11:51 2023
```

In case of MACs learnt on VXLAN tunnels or "port-access port-security" enabled ports, move scenario is handled by EVPN/port-access feature respectively and it performs the move by deleting the MAC from old port and installing it on new port. Thus, the MAC move data will be removed for the deleted MAC addresses.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show mac-address-table mac-move

```
show mac-address-table mac-move
   address <mac-address>
   vlan <1-4094>
```

Description

This command displays the MAC entries in the MAC address table that have moved at least one time. The output of this command can be filtered to display information for a specific VLAN or for a specific MAC address and VLAN.

Users will not be able to view mac-move count for clients that are transitioning between mac-auth enabled ports; however, users will be able to view the mac-move count when clients are transitioning from a mac-auth enabled port to a non-authenticated port.

Parameter	Description
`address`	(Optional) Show move information for a specific MAC address.
`vlan <1-4094>`	(Optional) Show move information for specific VLAN.

Examples

Showing the total number of MAC move addresses:

```
switch# show mac-address-table mac-move
Number of MAC Move addresses : 2

MAC Address        VLAN   Current Port    Previous Port   Move Count    Last Move
----------------------------------------------------------------------------------
------------
00:00:00:00:00:bb  10     1/1/28          1/1/27          2             Fri Sep 15
19:11:52 2023
00:00:00:00:00:aa  10     1/1/27          1/1/28          2             Fri Sep 15
19:11:51 2023
```

Showing the number MAC move addresses on a specific VLAN:

```
switch# show mac-address-table mac-move vlan 10
Number of MAC Move addresses : 2

MAC Address        VLAN   Current Port    Previous Port   Move Count    Last Move
----------------------------------------------------------------------------------
------------
00:00:00:00:00:bb  10     1/1/28          1/1/27          2             Fri Sep 15
19:11:52 2023
00:00:00:00:00:aa  10     1/1/27          1/1/28          2             Fri Sep 15
19:11:51 2023
```

Showing the number MAC move addresses on a specific MAC address and VLAN:

```
switch# show mac-address-table mac-move address 00:00:00:00:00:aa vlan 10
Number of MAC Move addresses : 1

MAC Address        VLAN   Current Port    Previous Port   Move Count    Last Move
----------------------------------------------------------------------------------
------------
00:00:00:00:00:aa  10     1/1/27          1/1/28          2             Fri Sep 15
19:11:51 2023
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.13 or earlier	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table port

`show mac-address-table port <PORT-NUM> [vsx-peer]`

Description

Shows the MAC address table entries for the specified port.

Parameter	Description
<PORT-NUM>	Specifies a physical port on the switch. Format: **member/slot/port**.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the MAC address table entries for port **1/1/1**:

```
switch# show mac-address-table port 1/1/1
MAC age-time            : 300 seconds
Number of MAC addresses : 1

MAC Address          VLAN     Type       Port
--------------------------------------------------
00:00:00:00:00:01    2        dynamic    1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table static

```
show mac-address-table static
```

Description

Shows all statically configured MAC addresses.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# show mac-address-table static
Number of MAC addresses : 2

MAC Address          VLAN      Port
--------------------------------------
00:00:00:00:10:02    1         1/1/1
00:00:00:00:10:03    1         1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac-address-table vlan

```
show mac-address-table vlan <VLAN-ID> [vsx-peer]
```

Description

Shows MAC addresses learned by or configured on the specified VLAN.

Parameter	Description
vlan *<VLAN-ID>*	Specifies the VLAN ID.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# show mac-address-table vlan 1
MAC age-time            : 300 seconds
Number of MAC addresses : 1

MAC Address          VLAN     Type       Port
--------------------------------------------------
00:00:00:00:00:01    1        dynamic    1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mac address table mac move

```
show mac-address-table mac-move [address <mac-address> vlan <vlan>] | [vlan <vlan>]
```

Description

Displays the MAC entries in the MAC address table that have moved at least once.

The output can be filtered based on a specific VLAN or specific MAC address and VLAN.

Parameter	Description
<address>	Displays information for a specific MAC address.

Parameter	Description
<vlan>	Displays information for specific VLANs.

Examples

Displaying the moved MAC addresses:

```
switch# show mac-address-table mac-move
Number of MAC addresses : 2

MAC Address        VLAN   Current Port    Previous Port   Move Count   Last Move
----------------------------------------------------------------------------------
-------------
00:00:00:00:00:bb  10     1/1/28          1/1/27          2            Fri Sep 15
19:11:52 2023
00:00:00:00:00:aa  10     1/1/27          1/1/28          2            Fri Sep 15
19:11:51 2023

switch# show mac-address-table mac-move address 00:00:00:00:00:aa vlan 10
Number of MAC Move addresses : 1

MAC Address        VLAN   Current Port    Previous Port   Move Count   Last Move
----------------------------------------------------------------------------------
------------
00:00:00:00:00:aa  10     1/1/27          1/1/28          2            Fri Sep 15
19:11:51 2023


switch# show mac-address-table mac-move vlan 10
Number of MAC Move addresses : 2

MAC Address        VLAN   Current Port    Previous Port   Move Count   Last Move
----------------------------------------------------------------------------------
------------
00:00:00:00:00:bb  10     1/1/28          1/1/27          2            Fri Sep 15
19:11:52 2023
00:00:00:00:00:aa  10     1/1/27          1/1/28          2            Fri Sep 15
19:11:51 2023
```

In case of MACs learnt on VXLAN tunnels or "port-access port-security" enabled ports, move scenario is handled by EVPN/port-access feature respectively and it performs the move by deleting the MAC from old port and installing it on new port. Thus, the MAC move data will be removed for the deleted MAC addresses.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

static-mac

```
static-mac
   <MAC-ADDR>
   vlan <VLAN-ID> port
   <PORT-NUM>
   workload
   no...
```

Description

Adds a static MAC address to the MAC address table and associates it with a port or existing VLAN. Static MAC addresses can only be assigned to layer 2 (non-routed) interfaces. Static MAC addresses are not affected by the MAC address aging time.

The **no** form of this command deletes a static MAC address.

Parameter	Description
<MAC-ADDR>	Specifies a MAC address (**xx:xx:xx:xx:xx:xx**), where **x** is a hexadecimal number from 0 to F.
`vlan` *<VLAN-ID>*	Specifies number of an existing VLAN.
`port` *<PORT-NUM>*	Specifies a physical port on the switch. Format: **member/slot/port**.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch(config)# static-mac 00:00:00:00:00:01 vlan 1 port 1/1/1
switch(config)# no static-mac 00:00:00:00:00:01 vlan 1 port 1/1/1

switch(config)# static-mac 00:00:00:00:00:01 vlan 1 port 1/1/2
1/1/2 is not an L2 port

switch(config)# static-mac 00:00:00:00:00:01 vlan 2 port 1/1/1
VLAN 2 not found
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

Chapter 73

MACsec commands

apply macsec policy

```
apply macsec policy <MACSEC-POLICY-NAME>
no apply macsec policy
```

Description

Within the selected interface context, applies the specified MACsec policy to the selected port. When a MACsec policy is applied to a port, MACsec is enabled on the port and all data traffic is blocked on the port until a secure channel is successfully established.

A MACsec policy can be applied to a physical interface port that is not part of any LAG ports or to a lag port. It can also be applied to an interface that is configured as an MCLAG, VSX keep-alive, or VSX inter-switch-link.

If a MACsec policy is already applied to the selected port, this command replaces the existing policy application.

For MACsec to work, an MKA policy must also be configured and applied to the same ports.

The **no** form of this command dissociates the specified policy from the port.

Parameter	Description
<MACSEC-POLICY-NAME>	Specifies the MACsec policy name. Range: 1 to 128 alphanumeric characters including only the three special characters "." (period), "-" (hyphen), and "_" (underscore).

Usage

- When any MACsec or MKA policy parameter is updated, any active MACsec session on all interfaces running the MACsec or MKA policy is terminated and restarted. This is indicated with the following prompt that provides an opportunity to not execute the **apply** command.

```
This policy is currently in use by one or more interfaces.
Updating the policy will cause existing MACsec sessions using
the policy to restart.
Continue (y/n)?
```

- For non-LAG ports, a range of ports can be specified in the **interface** command used to enter the interface context. For example, entering the interface context for ports 1/1/1 through 1/1/2:

```
switch(config)# interface 1/1/1-1/1/2
switch(config-if-<1/1/1-1/1/2>)# apply macsec policy MS_Policy1
```

- Not all interfaces on a switch may support the MACsec capability. An error will be generated when a policy is applied to a physical interface that is not capable of MACsec. For LAG ports, any non-MACsec capable interfaces that are part of the LAG will be blocked.

Examples

Applying a MACsec policy to a range of two ports:

```
switch(config)# interface 1/1/1-1/1/2
switch(config-if-<1/1/1-1/1/2>)# apply macsec policy MS_Policy1
```

Attempting to apply a MACsec policy to a port that is not MACsec capable:

```
switch(config)# interface 1/1/25
switch(config-if)# apply macsec policy MS_Policy1

MACsec is not supported on the interface.
switch(config-if)#
```

Removing MACsec policy association from a port:

```
switch(config)# interface 1/1/1
switch(config-if)# no apply macsec policy
```

Applying a MACsec policy to a LAG port:

```
switch(config)# interface lag 1
switch(config-if)# apply macsec policy MS_Policy1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights for this command.

bypass

```
bypass {ieee-bpdu}
no bypass {ieee-bpdu}
```

Description

Configures the MACsec policy to bypass MACsec for specific features.

When bypass is enabled on the BPDU, packets with a destination MAC matching the IEEE BPDU MAC (01:80:c2:00:00:0*) will bypass MACsec on both the egress and ingress directions.

By default, when MACsec is enabled on an interface, all BPDU frames except EAPoL are protected by MACsec. However, when an interface configured is configured to initiate a MACsec tunnel, the BPDU frames that are essential to the next hop device are sent with MACsec protection. This causes protocols such as LLDP and LACP to fail on the local link since the next hop device will fail to read the MACsec protected frames. To enable these protocols to operate on such links, you must enable BPDU bypass in the MACsec policy.

The **no** form of the command disables MACsec bypass for the specified feature. When no feature is specified, MACsec bypass is disabled for all the features.

Examples

Enabling the MACsec bypass for IEEE BPDUs:

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# bypass ieee-bpdu
OR
switch(config)# macsec policy Aggregator-Connect bypass ieee-bpdu
```

Disabling the MACsec bypass for IEEE BPDU:

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# no bypass ieee-bpdu
OR
switch(config)# no macsec policy Aggregator-Connect bypass ieee-bpdu
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Added support for the 6400 Switch Series.
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-macsec-policy`	Administrators or local user group members with execution rights for this command.

cipher-suite

```
cipher-suite {<CIPHER-SUITE>} [<CIPHER-SUITE>] ... [<CIPHER-SUITE>]
no cipher-suite [<CIPHER-SUITE>] ... [<CIPHER-SUITE>]
```

Description

Within the MACsec policy context, configures one or more cipher suites to be used to generate the SAK (Secure Authentication Key) for when the switch is the key server. When multiple cipher suites are configured, the most secure cipher suite is considered first during negotiation.

The no form of this command (without the ***<CIPHER-SUITE>*** parameter) resets to the default of considering (during negotiation) all supported cipher suites while giving priority to the most secure suite **gcm-aes-xpn-256**. Include the ***<CIPHER-SUITE>*** parameter to disable a particular cipher suite.

Parameter	Description
<CIPHER-SUITE>	Selects the cipher suite. Available cipher suites are: ■ gcm-aes-128: AES-128 encryption with Galois/Counter mode. ■ gcm-aes-256: AES-256 encryption with Galois/Counter mode. ■ gcm-aes-xpn-128: AES-128 encryption with Galois/Counter mode and extended packet numbering. ■ gcm-aes-xpn-256: AES-128 encryption with Galois/Counter mode and extended packet numbering. (The default and the most secure.)

Examples

Enabling a single cipher suite:

```
switch(config-macsec-policy)# cipher-suite gcm-aes-128
```

Enabling two cipher suites:

```
switch(config-macsec-policy)# cipher-suite gcm-aes-256 gcm-aes-xpn-256
```

Disabling a particular cipher suite:

```
switch(config-macsec-policy)# no cipher suite gcm-aes-128
```

Resetting to the default of considering all available cipher suites while giving priority to **gcm-aes-xpn-256**:

```
switch(config-macsec-policy)# no cipher-suite
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-macsec-policy`	Administrators or local user group members with execution rights for this command.

clear macsec statistics

`clear macsec statistics [interface <IF-RANGE>]`

Description

Clears MACsec statistics on all MACsec-enabled interfaces or on a specific interface or interface range. MACsec statistics are cleared for the entire switch rather than just in the current user session.

Parameter	Description
`interface <IF-RANGE>`	Specifies one or more interfaces for which MACsec statistics information is to be cleared.

Examples

Clearing MACsec statistics on an interface range:

```
switch# clear macsec statistics interface 1/1/1-1/1/4
```

Clearing MACsec statistics on all MACsec-enabled interfaces:

```
switch# clear macsec statistics
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Administrators or local user group members with execution rights for this command.

clear tag mode

```
clear tag mode {dot1q | none}
no clear tag mode {dot1q | none}
```

Description

Configures the part of the Ethernet payload in a MACsec protected frame that must precede the Security TAG (SecTAG) header in clear text.

The **dot1q** mode allows the 802.1q tag of a MACsec protected frame to be sent in clear text and placed before the MACsec SecTAG header. This enables the establishment of a MACsec tunnel between two MACsec endpoints over a non-MACsec Layer 2 network.

The **no** form of the command will configure the device to place the SecTAG header immediately after the destination and source MAC addresses.

Untagged traffic is not supported on a MACsec channel running clear-tag mode as **dot1q**. All untagged frames will be dropped on ingress.

Parameter	Description
`dot1q`	Specifies the encoding of a single 802.1q tag in clear text before Security TAG (SecTAG).
`none`	Specfies that the Security TAG (SecTAG) directly follows the Ethernet addresses. This is the default option.

Examples

Configuring the clear-tag mode as **dot1q.**:

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# clear-tag-mode dot1q
OR
switch(config)# macsec policy Aggregator-Connect clear-tag-mode dot1q
```

Resetting the clear-tag mode:

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# no clear-tag-mode dot1q
OR
switch(config)# no macsec policy Aggregator-Connect clear-tag-mode dot1q
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Added support for the 6400 Switch Series.
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-macsec-policy`	Administrators or local user group members with execution rights for this command.

confidentiality

```
confidentiality [offset {0|30|50}]
no confidentiality
```

Description

Within the MACsec policy context, enables Ethernet packet encryption after the MACsec header, optionally including a start-of-encryption offset. Confidentiality is enabled by default with an offset of 0 bytes after the MACsec header.

An offset of 0 causes the entire packet (after the MACsec header) to be encrypted. It is sometimes desirable to offset the start of the encryption deeper into the packet to allow for fields such as MPLS labels and 802.1Q tags to remain unencrypted.

Omitting the **offset** parameter enables confidentiality with whatever offset was configured previously.

The **no** form of this command disables confidentiality.

Parameter	Description
`offset {0|30|50}`	Selects the start-of-encryption offset (in bytes) into the packet after the MACsec header. Default 0 bytes.

Examples

Enabling confidentiality with an offset of 30 bytes:

```
switch(config-macsec-policy)# confidentiality offset 30
```

Disabling confidentiality

```
switch(config-macsec-policy)# no confidentiality
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-macsec-policy`	Administrators or local user group members with execution rights for this command.

include-sci-tag

```
include-sci-tag
no include-sci-tag
```

Description

Within the MACsec policy context, enables inclusion of the Secure Channel Identifier (SCI) tag in the Security TAG (SecTAG) field of the MACsec header. This is the default.

Inclusion of the SCI tag is not required on point-to-point links if the transmitting link has only one MACsec peer.

On the 8360 Switch Series models JL700A and JL701A, inclusion (or exclusion) of the SCI tag must be set identically at both ends of a MACsec channel. Asymmetric SCI tag settings are not supported.

The **no** form of this command disables inclusion of the Secure Channel Identifier (SCI) tag in the Security TAG (SecTAG) field of the MACsec header.

Examples

Enabling the SCI tag:

```
switch(config-macsec-policy)# include-sci-tag
```

Disabling the SCI tag:

```
switch(config-macsec-policy)# no include-sci-tag
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-macsec-policy`	Administrators or local user group members with execution rights for this command.

macsec policy

```
macsec policy <MACSEC-POLICY-NAME>
no macsec policy <MACSEC-POLICY-NAME>
```

Description

Creates the specified MACsec policy and then enters its context (displayed in the CLI as **config-macsec-policy**). If the MACsec policy already exists, this command enters the specified MACsec policy context.

A MACsec policy can be applied to one or more switch ports, enabling MACsec on the ports. An MKA (MACsec Key Agreement) policy must be applied to the same ports.

The **no** form of this command deletes the MACsec policy.

6300 Switch Series models that support MACsec:

6300 model	Ports	Speed
R8S89A	Downlinks: 1/1/1-1/1/24	100M/1G/2.5G/5G/10G
	Uplinks: 1/1/27-1/1/28	10G/25G
R8S90A	Downlinks: 1/1/1-1/1/48	100M/1G/2.5G/5G
	Uplinks: 1/1/51-1/1/52	10G/25G
R8S91A	Downlinks: 1/1/1-1/1/48	100M/1G/2.5G/5G
	Uplinks: 1/1/51-1/1/52	10G
R8S92A	Downlinks: 1/1/1-1/1/24	1G/10G
	Uplinks: 1/1/27-1/1/28	100M / 1G / 10G

A MACsec policy cannot be deleted if it is currently applied to any ports. All application of the policy must be removed before the policy can be deleted.

Parameter	Description
<MACSEC-POLICY-NAME>	Specifies the MACsec policy name. Range: 1 to 128 alphanumeric characters including only the three special characters "." (period), "-" (hyphen), and "_" (underscore).

Examples

Creating a MACsec policy:

```
switch(config)# macsec policy MS_Policy1
switch(config-macsec-policy)#
```

Deleting a MACsec policy (the policy cannot be currently applied to any ports):

```
switch(config)# no macsec policy MS_Policy1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.

macsec selftest

```
macsec selftest
no macsec selftest
```

Description

Configures the system to run a self test for MACsec on all MACsec-capable interfaces.

The **no** form of the command disables the MACsec self test on the device.

When enabled, the system will drop traffic on all MACsec capable interfaces until the MACsec selftest completes successfully on the interface. A MACsec selftest will be run in the following scenarios:

- On a VSF stack, the self test will run on a newly added switch
- When member is removed and re-added to stack
- When interface is removed from VSF link
- After every reboot (if enabled)

Examples

Running a MACsec self test:

```
switch(config)# macsec selftest
```

Disabling the MACsec self test:

```
switch(config)# no macsec selftest
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.

replay-protection

```
replay-protection [window-size <WINDOW-SIZE>]
no replay-protection
```

Description

Within the MACsec policy context, enables replay protection with the default or specified window size. With replay protection enabled, packets are expected to arrive within the replay protection window number of packets. For example with a window size of 10, any packet arriving out-of-sequence by more than 10 packets will be discarded. A window size of 0 (the default) enforces strict order of packet reception, discarding all packets not received in perfect sequence.

The **no** form of this command disables replay protections and resets the window size to its 0 default.

Parameter	Description
<WINDOW-SIZE>	Specifies the replay protection window size in packets. Default 0 packets. Range: 0 to 4294967295 packets.

Examples

Enabling replay protection with the default window size of 0 (strict order of packet reception):

```
switch(config-macsec-policy)# replay-protection
```

Enabling replay protection with a windows size of 100 packets:

```
switch(config-macsec-policy)# replay-protection window-size 100
```

Disabling replay protection.

```
switch(config-macsec-policy)# no replay-protection
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-macsec-policy`	Administrators or local user group members with execution rights for this command.

secure-mode

```
secure-mode {should-secure|must-secure}
no secure-mode [should-secure|must-secure]
```

Description

Configures the MACsec protection behavior on the interface when a MACsec Key Agreement (MKA) session is not established. Use **should-secure** to enable fail open mode for MACsec. Fail open mode ensures that traffic continues to flow if the MKA session is not established. Use **must-secure** (the default) to use MACsec in fail closed mode.

The **no** form of the command resets the behavior to the default, **must-secure**.

Parameter	Description
`{should-secure | must-secure}`	With **should-secure** set: ■ If the MKA session is not established, traffic is still allowed in clear text without the MACsec header. ■ If the MKA session is established successfully, traffic is allowed with the MACsec header. With **must-secure** set: ■ If the MKA session is not established, traffic is blocked on the data-plane. ■ If the MKA session is established successfully, traffic is allowed with the MACsec header.

Examples

Configuring **should-secure**:

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# secure-mode should-secure
OR
switch(config)# macsec policy Aggregator-Connect secure-mode should-secure
```

Configuring **must-secure**:

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# secure-mode must-secure
```

```
OR
switch(config)# macsec policy Aggregator-Connect secure-mode must-secure
```

Resetting to the default (**must-secure**):

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# no secure-mode
OR
switch(config)# no macsec policy Aggregator-Connect secure-mode
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config` `config-macsec-policy`	Administrators or local user group members with execution rights for this command.

show macsec policy

`show macsec policy [<MACSEC-POLICY-NAME>]`

Description

Shows information for one or all MACsec policies.

Parameter	Description
<MACSEC-POLICY-NAME>	Specifies the MACsec policy name. Range: 1 to 128 alphanumeric characters including only the three special characters "." (period), "-" (hyphen), and "_" (underscore).

Examples

Showing information for a specific MACsec policy:

```
switch# show macsec policy Aggregator-Connect

MACsec Policy Details

  Policy Name: Aggregator-Connect
  ----------------------------------------------------------------------------
    Cipher suite             : GCM-AES-128
    Include SCI              : Yes
    Confidentiality          : Enabled
    Confidentiality offset   : 0
    Replay protection        : Enabled
    Replay protection window : 0
    Data delay protection    : Enabled
    Secure mode              : Must-Secure
    Bypass                   : IEEE-BPDU
    Clear tag mode           : 802.1q
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command introduced on the 6400 Switch Series.
10.13	Command output updated to display **Bypass** and **Clear tag mode** information.
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show macsec selftest

`show macsec selftest [interface <IFRANGE>]`

Description

Shows the status of the MACsec selftest for MACsec capable interfaces. If an interface fails the self test then MACsec selftest should be disabled.

Parameter	Description
<IFRANGE>	Specifies the interface(s) for which to show MACsec selftest information.

Examples

Showing MACsec self test information for all interfaces that are MACsec capable:

```
switch# show macsec selftest
MACsec selftest status
```

```
Interface  Status          Failure Reason
---------  -----------     -----------------------
1/1/1      Initializing    --
1/1/2      Passed          --
1/1/3      Queued for run  --
1/1/4      Running
1/1/5      Failed          Encryption test failed
1/1/6      Failed          Decryption test failed
1/1/7      Failed          Initialization failed
1/1/8      Failed          Time out
1/1/9      Initialized
```

Showing MACsec self test information for a specific interface:

```
switch# show macsec selftest interface 1/1/1

MACsec selftest status

Interface  Status  Failure Reason
---------  ------  -----------------------------
1/1/1      Passed  --
```

Showing MACsec self test information for an interface range:

```
switch# show macsec selftest interface 1/1/1-1/1/3

MACsec selftest status

Interface   Status       Failure Reason
---------   -----------  -------------------------
1/1/1       Passed       --
1/1/2       Running      --
1/1/3       Failed       Decryption test failed
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Administrators or local user group members with execution rights for this command.

show macsec statistics

```
show macsec statistics [interface <IF-RANGE>]
```

Description

Shows MACsec statistics for all MACsec-enabled interfaces or a specific interface or interface range.

Parameter	Description
`interface <IF-RANGE>`	Specifies one or more interfaces for which MACsec statistics information is to be shown.

Examples

Showing MACsec statistics for a specific interface:

```
switch# show macsec statistics interface 1/1/1

MACsec Statistics

Interface 1/1/1
================

  Rx Statistics
  --------------
    Unicast Uncontrolled Packets    : 170438363226
    Multicast Uncontrolled Packets  : 66586
    Broadcast Uncontrolled Packets  : 4399
    Rx Uncontrolled Drop Packets    : 0
    Rx Uncontrolled Error Packets   : 0
    Rx Controlled Unicast Packets   : 170438369232
    Rx Controlled Multicast Packets : 31298
    Rx Controlled Broadcast Packets : 4399
    Rx Controlled Drop Packets      : 0
    Rx Controlled Error Packets     : 0
    Uncontrolled Octets             : 27270198219337
    Controlled Octets               : 21816165353719

  Tx Statistics
  --------------
    Unicast Uncontrolled Packets    : 0
    Multicast Uncontrolled Packets  : 33756
    Broadcast Uncontrolled Packets  : 0
    Rx Uncontrolled Drop Packets    : 0
    Rx Uncontrolled Error Packets   : 0
    Unicast Controlled Packets      : 171226945517
    Multicast Controlled Packets    : 98215
    Broadcast Controlled Packets    : 71894
    Rx Controlled Drop Packets      : 0
    Rx Controlled Error Packets     : 0
    Uncontrolled Octets             : 4658308
    Controlled Octets               : 21917110733304
    Common Octets                   : 27396383670012

  SecY Statistics
  ----------------
    Port Identifier : 1

    Rx Statistics
    --------------
      Transform Error Packets : 0
      Control Packets         : 35288
      Untagged Packets        : 0
      No Tag Packets          : 0
    Bad Tag Packets         : 39
    No SCI Packets          : 0
    Unknown SCI Packets     : 0
    Tagged Control Packets  : 0
    Overrun Packets         : 0

  Tx Statistics
  --------------
    Transform Error Packets : 0
    Control Packets         : 33756
    Untagged Packets        : 0

Transmit Secure Channel
------------------------
  SCI : ec0273f72f4d0001

  Statistics
  -----------
    Encrypted Packets : 171227173728
    Protected Packets : 0

  Secure Association
  -------------------
    Association Number : 0

    Statistics
    -----------
      Encrypted Packets          : 171227173728
      Encrypted Octets           : 19862392663792
      Protected Packets          : 0
      Protected Octets           : 0
      Too Long Packets           : 0
      SA Not In Use Packets      : 0

Receive Secure Channel
------------------------
  SCI : 00fd4568f4110001

  Statistics
  -----------
    Late Packets      : 0
    Not Valid Packets : 0
    Delayed Packets   : 0
    Ok Packets        : 170438441668

  Secure Association
  -------------------
    Association Number : 0

    Statistics
    -----------
      Unchecked Packets          : 0
      Delayed Packets            : 0
      Late Packets               : 0
      Ok Packets                 : 170438441668
      Invalid Packets            : 0
      Not Valid Packets          : 0
      Not Using SA Packets       : 0
      Unused SA Packets          : 0
      Decrypted Octets           : 19770908750641
      Validated Octets           : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show macsec status

`show macsec status [interface <IF-RANGE>] [detailed]`

Description

Shows MACsec status information for all MACsec-enabled interfaces or a specific interface or interface range.

Parameter	Description
`interface <IF-RANGE>`	Specifies one or more interfaces for which MACsec status information is to be shown.
`detailed`	Specifies that detailed status information is to be shown.

Usage

Applicable to when the **detailed** parameter is included: The stop time for the MACsec secure channel and secure association is updated only when the secure channel or association entry is being deleted. Therefore, it is never shown as set in the **show macsec status detailed command** output.

Examples

Showing MACsec summary information for all interfaces:

```
switch# show macsec status

MACsec Protocol Status

 Interface  Port ID  Policy                    Protection        Status  State
 ---------- -------- ------------------------- ----------------- ------- ------
 1/1/1      0        MS_Policy1                Conf, Offset 0    Up      Retire
 1/1/2      0        MS_Policy1                IC                Down    Init
 ...
```

Showing detailed MACsec information for a specific interface:

```
switch# show macsec status interface 1/1/1 detailed

Interface 1/1/1
================

Port Identifier: 0
===========================

  Policy          : MS_Policy1
  Status          : Up
  State           : Retire
  Cipher Suite    : GCM-AES-128
  Protection      : Conf, Offset 0
  Bypass          : IEEE-BPDU
  Clear Tag Mode  : None


  Transmit Secure Channel
  ------------------------
    SCI  : 000C29F6A4380004C
    SSCI : 1

    Secure Association
    -------------------
      Association Number   : 0 (old)
      Key Identifier       : 4F18CE25228178FD15976E4C
      Packet Number        : 9500
      SA-Start-Time        : Sun Oct 18 04:05:11 UTC 2020
      SA-Stop-Time         : Sun Oct 18 04:10:12 UTC 2020

      Association Number   : 1 (current)
      Key Identifier       : 4F18CE25228178FD15976E4C
      Packet Number        : 19000
      SA-Start-Time        : Sun Oct 18 04:10:13 UTC 2020
      SA-Stop-Time         : -

  Receive Secure Channel
  -----------------------
    SCI  : 000C29F6A4360003B
    SSCI : 2

    Secure Association
    -------------------
      Association Number   : 0 (old)
      Key Identifier       : 4F18CE25228178FD15976E4C
      Lowest Packet Number : 9500
      SA-Start-Time        : Sun Oct 18 04:05:12 UTC 2020
      SA-Stop-Time         : Sun Oct 18 04:10:12 UTC 2020

      Association Number   : 1 (current)
      Key Identifier       : 4F18CE25228178FD15976E4C
      Lowest Packet Number : 19000
      SA-Start-Time        : Sun Oct 18 04:10:13 UTC 2020
      SA-Stop-Time         : -
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command Introduced on the 6400 Switch Series.
10.13	Command output updated to display **Bypass** and **Clear tag mode** information.
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 74

Management interface commands

default-gateway

```
default-gateway <IP-ADDR>
no default-gateway <IP-ADDR>
```

Description

Assigns an IPv4 or IPv6 default gateway to the management interface. An IPv4 default gateway can only be configured if a static IPv4 address was assigned to the management interface. An IPv6 default gateway can only be configured if a static IPv6 address was assigned to the management interface. The default gateway should be on the same network segment.

The **no** form of this command removes the default gateway from the management interface.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.

Examples

Setting a default gateway with the IPv4 address of **198.168.5.1**:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# default-gateway 198.168.5.1
```

Setting an IPv6 address of **2001:DB8::1**:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# default-gateway 2001:DB8::1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-mgmt`	Administrators or local user group members with execution rights for this command.

ip static

```
ip static <IP-ADDR>/<MASK>
no ip static <IP-ADDR>/<MASK>
```

Description

Assigns an IPv4 or IPv6 address to the management interface.

The **no** form of this command removes the IP address from the management interface and sets the interface to operate as a DHCP client.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<MASK>	Specifies the number of bits in an IPv4 or IPv6 address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32 for IPv4, and 0 to 128 for IPv6.

Examples

Setting an IPv4 address of **198.51.100.1** with a mask of **24** bits:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# ip static 198.51.100.1/24
```

Setting an IPv6 address of **2001:DB8::1** with a mask of **32** bits:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# ip static 2001:DB8::1/32
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-mgmt`	Administrators or local user group members with execution rights for this command.

nameserver

```
nameserver <PRIMARY-IP-ADDR> [ <SECONDARY-IP-ADDR> ]
no nameserver <PRIMARY-IP-ADDR> [ <SECONDARY-IP-ADDR> ]
```

Description

Assigns a primary or secondary IPv4 or IPv6 DNS server to the management interface. IPv4 DNS servers can only be configured if a static IPv4 address was assigned to the management interface. IPv6 DNS servers can only be configured if a static IPv6 address was assigned to the management interface. The default gateway should be on the same network segment.

The **no** form of this command removes the DNS servers from the management interface.

Parameter	Description
<PRIMARY-IP-ADDR>	Specifies the IP address of the primary DNS server. Specify the address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<SECONDARY-IP-ADDR>	Specifies the IP address of the secondary DNS server. Specify the address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.

Examples

Setting primary and secondary DNS servers with the IPv4 addresses of **198.168.5.1** and **198.168.5.2** :

```
switch(config)# interface mgmt
switch(config-if-mgmt)# nameserver 198.168.5.1 198.168.5.2
```

Setting primary and secondary DNS servers with the IPv6 addresses of **2001:DB8::1** and **2001:DB8::2**:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# nameserver 2001:DB8::1 2001:DB8::2
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-mgmt`	Administrators or local user group members with execution rights for this command.

show interface mgmt

```
show interface mgmt [vsx-peer]
```

Description

Shows status and configuration information for the management interface.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show interface mgmt

  Address Mode                     : static
  Admin State                      : up
  Mac Address                      : 02:42:ac:11:00:02
  IPv4 address/subnet-mask         : 192.168.1.10/16
  Default gateway IPv4             : 192.168.1.1
  IPv6 address/prefix              : 2001:db8:0:1::129/64
  IPv6 link local address/prefix: fe80::7272:cfff:fefd:e485/64
  Default gateway IPv6             : 2001:db8:0:1::1
  Primary Nameserver               : 2001::1
  Secondary Nameserver             : 2001::2
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 75

mDNS gateway commands

debug mdns

```
debug mdns {all | config | init | packet | timer}
```

Description

Enables mDNS gateway debug logs for all or specific debug modules.

Parameter	Description
`all`	Enables debug logs for all mDNS gateway modules.
`config`	Enables debug logs to trace mDNS gateway configuration changes.
`init`	Enables debug logs to trace mDNS gateway initialization.
`packet`	Enables debug logs to trace mDNS gateway packet processing.
`timer`	Enables debug logs to trace mDNS gateway timer events.

Examples

Enabling debug logs for all modules:

```
switch# debug mdns all
```

Enabling debug logs for config module:

```
switch# debug mdns config
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

description

```
description <SERVICE-DESCRIPTION>
no description <SERVICE-DESCRIPTION>
```

Description

Adds description to a service.

The **no** form of this command deletes the description of a service.

Parameter	Description
<SERVICE-DESCRIPTION>	Specifies the service description. Maximum 128 characters.

Examples

Add a service description:

```
switch(config-mdns-sd-service)# description students-airplay-service
```

Remove the service description from a service:

```
switch(config-mdns-sd-service)# no description students-airplay-service
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-mdns-sd-service`	Administrators or local user group members with execution rights for this command.

id

```
id <SERVICE-ID>
no id <SERVICE-ID>
```

Description

Adds a service identifier to a service. The service ID configured here must be same as the service ID that is present in the packet.

The **no** form of this command removes a service ID from the service.

Parameter	Description
<SERVICE-ID>	Specifies the service ID. Maximum 128 characters.

Examples

Add a service ID:

```
switch(config-mdns-sd-service)# id _appletv-v2._tcp
```

Remove a service ID from a service:

```
switch(config-mdns-sd-service)# no id _appletv-v2._tcp
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-mdns-sd-service`	Administrators or local user group members with execution rights for this command.

mdns-sd

```
mdns-sd
no mdns-sd
```

Description

Enables mDNS gateway on a VLAN interface.

The **no** form of this command disables mDNS gateway on a VLAN interface.

This command is applicable only to VLAN interfaces.

The switch will not process mDNS packets until the mDNS gateway is enabled globally.

Examples

Enabling mDNS gateway on VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# mdns-sd
```

Disabling mDNS gateway on VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no mdns-sd
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

mdns-sd apply-profile tx

```
mdns-sd apply-profile <PROFILE-NAME> tx
no mdns-sd apply-profile <PROFILE-NAME> tx
```

Description

Configures mDNS gateway profile on the VLAN interface. When a profile is applied in the transmit direction, all the mDNS traffic transmitted on the VLAN interface will be filtered based on the rules specified in the transmit profile.

The **no** form of this command deletes the profile configuration from the VLAN interface in the transmit direction.

This command is applicable only to VLAN interfaces.
When no profile is configured on an interface then the default action is permit.

Parameter	Description
<PROFILE-NAME>	Specifies the profile name. Maximum 32 characters.

Examples

Configuring mDNS gateway profile on VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# mdns-sd
switch(config-if-vlan)# mdns-sd apply-profile student tx
```

Deleting mDNS gateway profile on VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no mdns-sd apply-profile student tx
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

mdns-sd enable

```
mdns-sd enable
no mdns-sd enable
```

Description

Enables mDNS gateway.

The **no** form of this command disables mDNS gateway. Once the **no** form of this command is executed, all the SVI VLANs, even though enabled with mDNS gateway, will stop reflecting mDNS packets to the enabled VLANs.

Examples

Enable mDNS gateway:

```
switch(config)# mdns-sd enable
```

Disable mDNS gateway:

```
switch(config)# no mdns-sd enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

mdns-sd profile

`mdns-sd profile <PROFILE-NAME>`

Description

Creates a profile that can be applied on one or more L3 VLAN interfaces.

The profile contains a set of rules that define various match parameters such as service-name and service-instance-name.

Parameter	Description
<PROFILE-NAME>	Specifies the name of the profile. Maximum 32 characters.

Examples

Creating a profile:

```
switch(config)# mdns-sd profile student
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

mdns-sd service

```
mdns-sd service <SERVICE-NAME>
no mdns-sd service
```

Description

Configures a service for mDNS gateway. You can group multiple service IDs into a single user-defined service name.

The **no** form of this command deletes a service.

A service cannot be deleted if it is being used as a match parameter in a filter rule in any profile.

Parameter	Description
<SERVICE-NAME>	Specifies the name of the service. Maximum 32 characters.

Examples

Configure a service for mDNS gateway:

```
switch(config)# mdns-sd service students
```

Delete a service:

```
switch(config)# no mdns-sd service students
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

clear mdns-sd statistics

```
clear mdns-sd statistics
```

Description

Clears all mDNS gateway statistics.

Examples

Clear mDNS gateway statistics:

```
switch(config)# clear mdns-sd statistics
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

sequence-number

```
<SEQUENCE_NUMBER> {permit | deny}
 {service-name <SERVICE-NAME> | service-instance-name <SERVICE-INSTANCE-NAME>}
no <SEQUENCE-NUMBER> {permit | deny}
 {service-name <SERVICE-NAME> | service-instance-name <SERVICE-INSTANCE-NAME>}
```

Description

Adds a filter rule to the service profile. The sequence number configured determines the priority with which the rule is matched. Lower the sequence number, higher is the priority.

Following are the filter match parameters:

- **Service-name:** mDNS packets are matched against the service IDs configured under the service name.
- **Service-instance-name:** mDNS packets are matched against the service instance name present in the mDNS packets.

When no match criteria is specified in the rule, then the rule can be matched against any mDNS packet. Once the match is found then either the packet can be permitted or denied based on the action specified in the rule.

The **no** form of this command deletes the filter configured in the service profile.

When an mDNS packet does not match any of the filters configured in the profile, then the packet is denied.

Parameter	Description
<SERVICE-NAME>	Specifies the service name. Maximum 32 characters.
<SERVICE-INSTANCE-NAME>	Specifies the service instance name. Maximum 128 characters.

Examples

Adding filter rules to a service profile:

```
switch(config)# mdns-sd profile student
switch(config-mdns-sd-profile)# 10 permit service-name default-appletv
switch(config-mdns-sd-profile)# 20 deny service-name default-appletv service-
instance-name office._pdl-datastream._tcp.local
switch(config-mdns-sd-profile)# 30 permit service-instance-name library._pdl-
datastream._tcp.local
switch(config-mdns-sd-profile)# 40 deny
```

Deleting filter rules to a service profile:

```
switch(config)# mdns-sd profile student
switch(config-mdns-sd-profile)# 10 permit service-name default-appletv
switch(config-mdns-sd-profile)# 20 deny service-name default-appletv service-
instance-name office._pdl-datastream._tcp.local
switch(config-mdns-sd-profile)# 30 permit service-instance-name library._pdl-
datastream._tcp.local
switch(config-mdns-sd-profile)# no 30 permit service-instance-name library._pdl-
datastream._tcp.local
switch(config-mdns-sd-profile)# 40 deny
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-mdns-sd-profile`	Administrators or local user group members with execution rights for this command.

show mdns-sd service-entries

```
show mdns-sd service-entries {service-id <SERVICE-ID> | record-type <RECORD-TYPE>}
```

Description

Shows all the services exchanged in the mDNS gateway enabled VLANs.

Parameter	Description
<SERVICE-ID>	Specifies the service ID. Maximum 128 characters
<RECORD-TYPE>	Specifies the type of record. Record can be one of the following values: PTR SRV TXT A

Examples

Displaying service entries learnt from mDNS gateway enabled VLANS:

```
switch# show mdns-sd service-entries
MAC-Address : 01:00:00:0e:21:23
VLAN Id     : 10
Record Name : _touch-able._tcp.local
Record Type : PTR
TTL         : 4500

MAC-Address : 01:00:00:0e:21:23
VLAN Id     : 10
Record Name : 523899E219D4C562._touch-able._tcp.local
Record Type : SRV
TTL         : 4500

MAC-Address : 01:00:00:0e:21:23
VLAN Id     : 10
Record Name : 523899E219D4C562._touch-able._tcp.local
Record Type : TXT
TTL         : 4500
```

Displaying service entries for a service and record type:

```
switch# show mdns-sd service-entries service-id _touch-able._tcp record-type ptr
MAC-Address : 01:00:00:0e:21:23
VLAN Id     : 10
Record Name : _touch-able._tcp.local
Record Type : PTR
TTL         : 4500
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mdns-sd statistics

```
show mdns-sd statistics [vlan [<VLAN-ID>]]
```

Description

Shows the mDNS packets received and sent globally, and per VLAN.

Parameter	Description
<VLAN-ID>	Specifies the VLAN ID. Required. Range 1 to 4094.

Examples

Displays total packets:

```
switch# show mdns-sd statistics
Packets Recieved    : 100
Packets Sent        : 150
Packets Dropped     :  50
```

Displays total packets for all VLANs:

```
switch# show mdns-sd statistics vlan
VLAN 10
Packets Recieved    : 100
Packets Sent        : 100
Packets Dropped     :   0

VLAN 20
Packets Recieved    :   0
Packets Sent        :  50
Packets Dropped     :  50
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mdns-sd statistics profile

`show mdns-sd statistics profile <PROFILE-NAME>`

Description

Displays the number of packets permitted or denied by various filter rules in a profile.

Parameter	Description
<PROFILE-NAME>	Specifies the profile name. Maximum 32 characters.

Examples

Displaying statistics for a profile:

```
switch# show mdns-sd statistics profile student
--------------------------
Sequence-Number Hit-Count
--------------------------
10              100
20               25
30              150

Total number of packets permitted by the profile : 250
Total number of packets denied by the profile    :  50
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mdns-sd summary

`show mdns-sd summary`

Description

Shows whether mDNS gateway is enabled globally and at the VLAN interface level. It also shows the profile applied on various VLAN interfaces.

Examples

Displaying mDNS gateway summary:

```
switch# show mdns-sd summary
global mdns-sd status: enabled
----------------------------
VLAN-Id Status   Tx-Profile
----------------------------
1       enabled  student
2       enabled  employee
3       disabled teacher
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config interface

`show running-config interface <INTERFACE-NAME>`

Description

Shows the configuration of profiles for an interface.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface name.

Examples

Displaying configuration of profile at VLAN 10:

```
switch# show running-config interface vlan10
interface vlan10
```

```
    mdns-sd
    mdns-sd apply-profile teacher tx
    ip address 10.1.1.1/24
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config mdns-sd profile

`show running-config mdns-sd profile <PROFILE-NAME>`

Description

Shows the configuration of all or a specific profile.

Parameter	Description
<PROFILE-NAME>	Specifies the profile name. Maximum 32 characters.

Examples

Displaying configuration of all profiles:

```
switch# show running-config mdns-sd profile
mdns-sd profile student
  10 deny service-type default-print service-instance-name office._pdl-
datastream._tcp.local
  50 permit service-type default-airplay
  51 permit service-type default-print

mdns-sd profile teacher
  10 deny service-type default-print service-instance-name office._pdl-
datastream._tcp.local
  50 permit service-type default-airplay
  51 permit service-type default-print
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config mdns-sd service

```
show running-config mdns-sd service <SERVICE-NAME>
```

Description

Shows the running configuration of all or a specific mDNS service.

Parameter	Description
<SERVICE-NAME>	Specifies the service name. Maximum 32 characters.

Examples

Displaying running configuration of all mDNS services:

```
switch# show running-config mdns-sd service
mdns-sd service default-airplay
  id _airplay._tcp
  id _appletv-v2._tcp
  id _roap._tcp

mdns-sd service itunes
  id _home-sharing._tcp
  id _apple-mobdev._dev
```

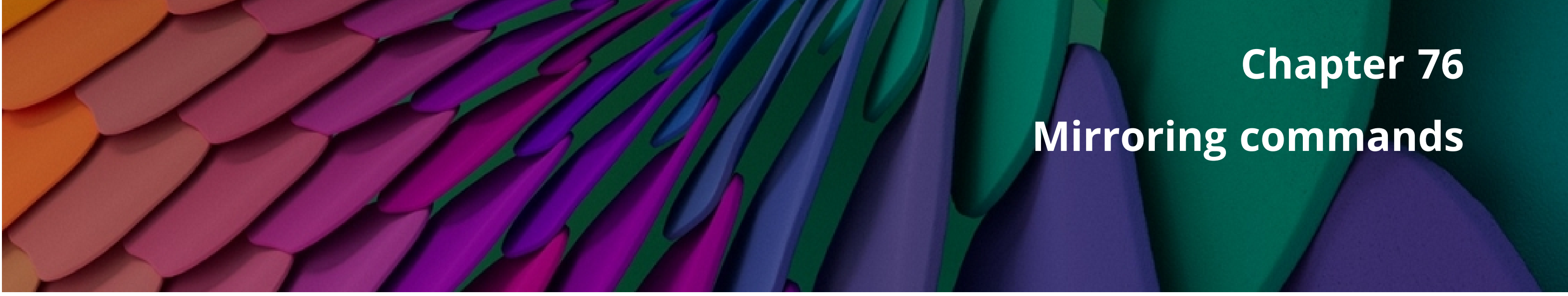
For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 76

Mirroring commands

clear mirror

```
clear mirror [all | <SESSION-ID>]
```

Description

Clears the mirror statistics for all configured mirror sessions or a specified session

Parameter	Description
`all`	Specifies all configured sessions.
`<SESSION-ID>`	Specifies a numeric identifier for the session. Range: 1 to 4

Examples

Clearing mirror statistics for all configured mirror sessions:

```
switch# clear mirror all
```

Clearing mirror statistics for mirror session 1:

```
switch# clear mirror 1
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

clear mirror endpoint

```
clear mirror endpoint [<NAME>]
```

Description

Clears mirror endpoint statistics for all configured mirror endpoints. The optional parameter can be added to clear a specific mirror endpoint.

Parameter	Description
<NAME>	Specifies name of the mirror endpoint instance to be cleared.

Examples

Clearing statistics for all configured mirror endpoints:

```
switch# clear mirror endpoint
```

Clearing mirror statistics for mirror endpoint test:

```
switch# clear mirror endpoint test
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

comment

```
comment <COMMENT>
no comment
```

Description

Specifies a comment for the mirroring session.

When used in mirror endpoint command context, specifies a comment for the mirror endpoint.

The **no** form of this command removes the comment.

Parameter	Description
<COMMENT>	A comment string of up to 64 characters composed of letters, numbers, underscores, dashes, spaces, and periods.

Usage

Comments are optional and can be added or removed at any time without affecting the state of the mirroring session.

Adding a comment to a session that already has a comment replaces the existing comment.

Examples

Adding a comment to a mirror session:

```
switch(config-mirror-3)# comment This Mirror will be removed during next
maintenance window
```

Removing the comment from mirror session 3:

```
switch(config-mirror-3)# no comment
```

Adding a comment to a mirror endpoint:

```
switch(config-mirror-endpoint-test)# comment Monitor endpoint traffic
```

Replacing the existing comment for mirror endpoint:

```
switch(config-mirror-endpoint-test)# comment Monitor statistics on each endpoint
interfaces
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-mirror-`*<SESSION-ID>* `config-mirror-endpoint`	Administrators or local user group members with execution rights for this command.

copy tcpdump-pcap

```
copy tcpdump-pcap <FILE-NAME> <REMOTE-URL>
```

Description

Saves packet capture files to external storage.

Parameter	Description
<FILE-NAME>	Specifies the packet capture file to save.
<REMOTE-URL>	Specifies the external storage to which the packet capture file will be saved.

Usage

Only four files can be saved at any point on the switch. Packet capture files are not saved after a failover or reboot. View a list of saved files using **diag utilities list-files**.

Examples

Saving my_capture_file.pcap to sftp://root@10.0.0.2/file.pcap:

```
switch# copy tcpdump-pcap my_capture_file.pcap sftp://root@10.0.0.2/file.pcap
root@10.0.0.2's passowrd:
Connected to 10.0.0.2.
sftp > put my_capture_file.pcap file.pcap
Uploading my_capture_file.pcap to /root/file.pcap
my_capture_file.pcap                                        100%    156    219.8KB/s    00:00
Copied successfuly.
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

copy tshark-pcap

```
copy tshark-pcap <REMOTE-URL> [vrf <VRF-NAME>]
```

Description

Copies the tshark capture data to a file on a TFTP or SFTP server.

Parameter	Description
<REMOTE-URL>	Specifies the capture file on a remote TFTP or SFTP server. The URL syntax is: {tftp:// | sftp://**<USER>**@} {**<IP>**|**<HOST>**} [:**<PORT>**] [;blocksize=**<SIZE>**]/*<FILE>*
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Example

Copying the capture data to a file on SFTP server 10.0.0.2:

```
switch# copy tshark-pcap sftp://root@10.0.0.2/file.pcap

root@10.0.0.2's password:
Connected to 10.0.0.2.
sftp> put packets.pcap file.pcap
Uploading packets.pcap to /root/file.pcap
packets.pcap                                  100%  156   219.8KB/s   00:00
Copied successfully.
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

destination cpu

```
destination cpu
no destination cpu
```

Description

The command causes the mirror session to transmit mirrored packets to the switch CPU. This destination may be configured for multiple sessions, however only one such configured session may be active at a given time.

The diagnostic utility Tshark may be used to view and capture packets transmitted to the CPU through this route. Ctrl+C must be entered to terminate a Tshark capture session. More details can be found in the **Supportability Guide**.

The **no** form of this command will immediately stops mirroring traffic to the CPU, but will not remove any sources from the mirror configuration.

Examples

Configuring a mirror session with CPU as the destination.

```
switch# config
switch(config)# mirror session 1
switch(config-mirror-1)# destination cpu
```

Removing the destination entirely.

```
switch(config-mirror-1)# no destination cpu
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-mirror-<SESSION-ID>`	Administrators or local user group members with execution rights for this command.

destination interface

```
destination interface {<INTERFACE-ID>|<LAG-NAME>}
no destination interface {<INTERFACE-ID>|<LAG-NAME>}
```

Description

Configures the specified interface as the destination of the mirrored traffic.

The **no** form of this command immediately disables the mirroring session and removes the specified destination interface from the configuration.

Parameter	Description
<INTERFACE-ID>	Specifies a interface. Format: `member/slot/port`.
<LAG-NAME>	Specifies a LAG (link aggregation group) identifier.

Usage

Configuring a different destination interface in an enabled mirroring session causes all mirrored traffic to use the new destination interface. This action might cause a temporary suspension of mirrored source traffic during the reconfiguration.

Examples

On the 6400 Switch Series, interface identification differs.

Configuring a mirroring session and adding an interface as a destination:

```
switch(config)# mirror session 1
switch(config-mirror-1)# destination interface 1/1/1
```

Replacing the existing destination with different interface:

```
switch(config-mirror-1)# destination interface 1/1/12
```

Removing a destination:

```
switch(config-mirror-1)# no destination interface 1/1/12
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Switch	Destination interface limit per mirror session (4 possible sessions)
6300	64
6400	64

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-mirror-<SESSION-ID>`	Administrators or local user group members with execution rights for this command.

destination tunnel

```
destination tunnel <TUNNEL-IPV4> source <SOURCE-IPv4-ADDR>
   dscp <DSCP-VALUE> vrf <VRF-NAME>
no destination tunnel
```

Description

Specifies the tunnel where all mirrored traffic for the session is transmitted. Only one tunnel destination is allowed per session.

You may configure multiple mirror sessions with the same source/destination IP address pair, however, only one of those sessions sharing the same source/destination IP address pair can be enabled at a given time.

ERSPAN is not supported leaving the switch by the OOB port. If VRF management is configured for an ERSPAN session, the session will be in "mirror_err_tunnel_oob_port_not_supported" operation status.

ERSPAN is not supported leaving the switch encapsulated within another tunnel (e.g. GRE IPv4). When the path to the destination IP address will leave via a tunnel, the session will be in "tunnel_route_resolution_not_populated" operation status.

The interface/LAG used to transmit ERSPAN packets should not be a source in the same mirror session.

The **no** form of this command will cease the use of the tunnel and disable the session.

Parameter	Description
<TUNNEL-IPV4-ADDR>	Specifies the tunnel address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<SOURCE-IPv4-ADDR>	Specifies the source address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<DSCP-VALUE>	Specifies the DSCP value to be carried within the DS field of ERSPAN packet header. Range: 0 to 63. Default: 0.
<VRF-NAME>	Specifies a VRF name. Default: default.

Examples

Creating a Mirror Session and adding tunnel destination, source, dscp, and VRF:

```
switch# config
switch(config)# mirror session 1
switch(config-mirror-1)# destination tunnel 1.1.1.1 source 2.2.2.2 dscp 10 vrf
default
```

Replacing the existing tunnel destination:

```
switch(config-mirror-1)# destination tunnel 11.12.13.14 source 2.2.2.2 dscp 10 vrf
default
```

Replacing the existing destination with a different DSCP value:

```
switch(config-mirror-1)# destination tunnel 11.12.13.14 source 2.2.2.2 dscp 2 vrf
default
```

Removing the destination:

```
switch(config-mirror-1)# no destination tunnel
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-mirror-<SESSION-ID>`	Administrators or local user group members with execution rights for this command.

diagnostic

```
diagnostic

diag utilities tshark [file]
diag utilities tshark [delete-file]
```

Description

Captures packets from a mirror-to-cpu session, and save the most recent 32MB to pcap file which can then be copied and analyzed. When capturing a mirror-to-cpu session to a file, packets will not be dumped to the console.

The `diagnostic` command must be entered prior to the `diag utilities tshark` command.

Use the **delete-file** form of this command to delete the most recent capture file.

Since **file** and **delete-file** are optional, the behavior of the base command **diag utilities tshark** does **not** save anything to a file, and instead dumps the tshark session to the console until **CTRL + c** is entered.

Parameter	Description
`file`	Saves captured packets to a temporary file.
`delete-file`	Deletes the most recent captured file.

Example

Performing diagnostic:

```
switch# diagnostic

switch# diagnostic utilities tshark file
Inspecting traffic mirrored to the CPU until Ctrl-C is entered
^CEnding traffic inspection.
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

diag utilities tcpdump

```
diag utilities tcpdump [command <TEXT> | delete file <FILE-NAME> | list-files |
  vrf <VRF-NAME> | count <COUNT-NUM> | proto <PROTO-NUM> | host-ip <IP-ADDR> | source-ip
  <IP-ADDR> | destination-ip <IP-ADDR> | host-port <PORT> | source-port <PORT> |
  destination-port <PORT> | verbosity <LEVEL> | print <DATA> | ethernet-type <ETH-NUM>]
```

Description

Captures traffic received or transmitted over a network.

Parameter	Description
`command <TEXT>`	Captures packets based on a specified tcpdump command string.
`delete file <FILE-NAME>`	Deletes specified tcpdump list files.
`list-files`	Lists all the tcpdump capture files saved on the device.
`vrf <VRF-NAME>`	Captures packets on the specified VRF. If no VRF is named, the default is used.
`count <COUNT-NUM>`	Runs the tcpdump command until the specified number of packets are captured. Range: 1-2147483647.
`proto <PROTO-NUM>`	Captures packets of a particular type based on IP protocol number. Range: 0-255.
`host-ip <IP-ADDR>`	Captures packets matching with the source or destination IP address.
`source-ip <IP-ADDR>`	Captures packets from the specified IP address.
`destination-ip <IP-ADDR>`	Captures packets sent to the specified IP address.
`host-port <PORT>`	Captures packets matching with the source or destination port.
`source-port <PORT>`	Captures packets from the specified IP port.
`destination-port <PORT>`	Captures packets sent to the specified IP port.
`verbosity <LEVEL>`	Captures packets of the specified verbosity. Range: level1-level4. If no verbosity is specified, the default is level1.
`print <DATA>`	Captures the data of each packet. The maximum is 262144 bytes

Parameter	Description
`ethernet-type <ETH-NUM>`	Captures packets based on the particular ethernet type. Range: 0-65535.

Usage

- When using the **command** option, the only traffic captured will be packets that have been mirrored to the CPU.
- When using the **command** option, command line sanitization is performed to prevent options that may cause harm or security issues. The following options are blocked:
  - -i/--interface
  - -Z
  - -B/--buffer-size
  - -C
  - -W
  - -Z/--relinquish privileges
- Non-word operators such as "&" or "|" are not allowed. Use boolean keywords such as "and," "or," and "not."
- When using **command -r** to read a file, do not provide any directory path characters. Use list-files command to get the list of file names currently saved on the device, and then use those file names.
- A total of four files can be saved at any given point on the device. Packet capture files are not saved after a failover or reboot, but can be saved to external storage using the **copy tcpdump-pcap** command.

Examples

Inspecting traffic mirrored to the CPU via tcpdump and saving the output to my_capture_file.pcap:

```
switch# diag utilities tcpdump command -c 2 -x -w my_capture_file.pcap
Inspecting traffic mirrored to the CPU via tcpdump until Ctrl-C is entered.
2 packets captured
2 packets received by filter
0 packets dropped by kernel
Ending traffic capture.
```

Listing saved capture files:

```
switch# diag utilities tcpdump list-files
my_capture_file.pcap
```

Reading my_capture_file.pcap:

```
switch# diag utilities tcpdump command -r my_capture_file.pcap
reading from file /tmp/tcpdump/my_capture_file1.pcap, link-type EN10MB (Ethernet)
  1  11:59:34.047867 IP6 localhost.40318 > localhost.ntp: NTPv2, Reserved, length
12
        0x0000:  0000 0304 0006 0000 0000 0000 0000 86dd  ................
        0x0010:  600a 7e47 0014 1140 0000 0000 0000 0000  `.~G...@........
        0x0020:  0000 0000 0000 0001 0000 0000 0000 0000  ................
        0x0030:  0000 0000 0000 0001 9d7e 007b 0014 0027  .........~.{...'
        0x0040:  1601 0001 0000 0000 0000 0000            ............
  2  11:59:34.047915 IP6 localhost.ntp > localhost.40318: NTPv2, Reserved, length
12
        0x0000:  0000 0304 0006 0000 0000 0000 0000 86dd  ................
        0x0010:  6b8d 23c5 0014 1140 0000 0000 0000 0000  k.#....@........
        0x0020:  0000 0000 0000 0001 0000 0000 0000 0000  ................
        0x0030:  0000 0000 0000 0001 007b 9d7e 0014 0027  .........{.~...'
        0x0040:  d681 0001 c016 0000 0000 0000
```

Removing my_capture_file.pcap:

```
switch# diag utilities tcpdump delete-file my_capture_file.pcap
Successfully removed file
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

disable

```
disable
```

Description

Disables the mirroring session specified by the current command context.

Usage

By default, mirroring sessions are disabled.

When a mirroring session is disabled, the **show mirror** command for that session ID shows an **Admin Status** of **disable** and an **Operation Status** of **disabled**.

Example

Disabling a mirroring session:

```
switch(config)# mirror session 3
switch(config-mirror-3)# disable
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-mirror-<SESSION-ID>`	Administrators or local user group members with execution rights for this command.

enable

```
enable
```

Description

Enables the mirroring session for the current command context.

Usage

By default, mirroring sessions are disabled.

When a mirroring session is enabled, the **show mirror** command for that session ID shows an **Admin Status** of **enable** and an **Operation Status** of **enabled**.

If sFlow is enabled on an interface and a mirroring session specifies the same interface as the source of received traffic (the source is configured with a direction of **rx** or **both**):

- The attempt to enable the mirroring session fails and an error is returned.

When adding, removing, or changing the configuration of a source interface in an enabled mirroring session, packets from other mirror sources using the same destination interface might be interrupted.

Example

On the 6400 Switch Series, interface identification differs.

Configuring and enabling a mirroring session:

```
switch(config)# mirror session 3
switch(config-mirror-3)# source interface 1/1/2 rx
switch(config-mirror-3)# destination interface 1/1/3
switch(config-mirror-3)# comment Monitor router port ingress-only traffic
switch(config-mirror-3)# enable
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-mirror-<SESSION-ID>`	Administrators or local user group members with execution rights for this command.

mirror endpoint

```
mirror endpoint <NAME>
no mirror endpoint <NAME>
```

Description

Creates the specified mirror endpoint or enters its context if it already exists. The specifics of a mirror endpoint are created or altered while in the mirror endpoint context and the mirror endpoint is enabled or disabled from this context. It may be possible to support different encapsulations by different ASICs. For example, UDP for PVOS compatibility. Termination of GRE encapsulation is also supported.

The **no** form of this command removes an existing mirror endpoint. An enabled mirror endpoint is automatically disabled first before removal.

Parameter	Description
<NAME>	Specifies mirror endpoint name.

Examples

Creating a mirror endpoint named test :

```
switch(config)# mirror endpoint test
```

Deleting mirror endpoint named test:

```
switch(config)# no mirror endpoint test
```

Configuring a mirror endpoint named test :

```
6100(config)# mirror endpoint test
6100(config-mirror-endpoint-test)#
6100(config-mirror-endpoint-test)# destination
  interface  Specify interfaces to send traffic
6100(config-mirror-endpoint-test)# destination interface
  IFNAMELIST  An interface, a range or a comma seperated list of interfaces
6100(config-mirror-endpoint-test)# destination interface 1/1/3
```

```
  <cr>
6100(config-mirror-endpoint-test)# destination interface 1/1/3
6100(config-mirror-endpoint-test)#
6100(config-mirror-endpoint-test)# source 1.1.1.1 destination 1.1.1.2 id 1 vrf
default
6100(config-mirror-endpoint-test)#
```

Only physical ports can be configured as interface for mirror-endpoint destination. LAG port is not supported as interface for mirror-endpoint destination.

The maximum allowed number of destination interfaces for both mirror-session and mirror-endpoint is 1.

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.13.1000	Added support for 4100i, 6000, and 6100 switches.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

mirror session

```
mirror session <SESSION-ID>
no mirror session <SESSION-ID>
```

Description

Creates a mirroring session configuration context or enters an existing mirroring session configuration context.

From this context, you can enter commands to configure and enable or disable the mirroring session.

The **no** form of this command removes an existing mirroring session from the configuration.

Parameter	Description
<SESSION-ID>	Specifies the session identifier. Range: 1 to 4

Examples

```
switch(config)# mirror session 1
switch(config-mirror-1)#

switch(config)# mirror session 3
switch(config-mirror-3)#

switch(config)# no mirror session 1
switch(config)#
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show mirror

`show mirror [<SESSION-ID>] [vsx-peer]`

Description

Shows information about mirroring sessions. If **`<SESSION-ID>`** is not specified, then the command shows a summary of all configured mirroring sessions. If **`<SESSION-ID>`** is specified, then the command shows detailed information about the specified mirroring session.

Parameter	Description
`<SESSION-ID>`	Specifies the session identifier. Range: 1 to 4
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Admin Status indicates the configured status. Admin Status is one of the following values:

`enable`
The mirroring session is enabled.
`disable`
The mirroring session has been configured but not yet enabled, or has been disabled.

Operation Status indicates the status of the mirroring session. Operation Status is one of the following values:

`dest_doesnt_exist`

The configured destination interface is not found in the system. The mirroring session cannot be enabled.
`destination_shutdown`
The mirroring session is enabled, but the destination interface is shut down. No traffic can be monitored.
`disabled`
The mirroring session is disabled and is not in an error condition.
`enabled`
The mirroring session is enabled.
`external/driver_error`
An internal ASIC hardware error occurred.
`hit_active_sessions_capacity`
The mirroring session could not be enabled because the maximum number of supported mirroring sessions are already enabled.
`internal_error`
An invalid parameter was passed to the ASIC software layer.
`no_dest_configured`
The mirroring session does not have a destination interface configured.
`no_name_configured`
A software error occurred. The mirroring session does not have a session ID in its configuration.
`null_mirror`
A software error occurred. The session object reference is invalid.
`out_of_memory`
The system is out of memory, reboot recommended.
`tunnel_route_resolution_not_populated`
If the destination tunnel IP address is not reachable.
`unknown_error`
An unexpected error occurred.

Examples

On the 6400 Switch Series, interface identification differs.

Showing summary information about all configured mirroring sessions:

```
switch# show mirror
ID  Admin Status  Operation Status
--- ------------- ----------------------------------------------------
1   enable        enabled
2   disable       disabled
3   disable       disabled
4   enable        internal_error
```

Showing detailed information about a single mirroring session:

```
switch# show mirror 3
 Mirror Session: 3
 Admin Status: disable
 Operation Status: disabled
 Comment: Monitor router port ingress-only traffic
 Source: interface 1/1/2 rx
 Destination: interface 1/1/3
 Output Packets: 0
 Output Bytes: 0
switch#
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mirror endpoint

`show mirror endpoint [<NAME>]`

Description

Shows a list of all configured mirror endpoints, their Admin Status and their Operation Status.

The optional parameter will display the details of the specified mirror endpoint if it exists.

Parameter	Description
<NAME>	Specifies name of the mirror endpoint instance to be displayed.

Examples

Showing a summary of all configured mirror endpoints on the switch:

```
switch# show mirror endpoint
Name    Admin Status   Operation Status
-----  -------------- ----------------------------------------------------
test    enable         enabled
monitor disable        disabled
```

Showing the details of enabled mirror endpoint test:

```
switch# show mirror endpoint test
Mirror Endpoint: audit
Admin Status: enable
Operation Status: enabled
Comment: Mirror Endpoint Audit
Type: gre
Tunnel: source 1.1.1.1 destination 1.1.1.2 id 1 vrf default
Interface: 1/1/3
Output Packets: 123456789
Output Bytes: 0
```

"Output Packets" in "show mirror endpoint [name]" is only supported for statistics.

"Output Bytes" in "show mirror endpoint [name]" is not supported due to ASIC limitation.

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

shutdown

```
shutdown
no shutdown
```

Description

Enables mirror endpoint from its default disabled state. To verify the mirror endpoint was successfully activated, run the `show mirror endpoint NAME` command and verify that the **`Admin Status`** and **`Operational Status`** has changed from disabled to enabled. If the status value remains disabled, consult the system logs to determine the reason for activation failure. To disable the mirror endpoint, first disable the remote mirror session on the switch that's originating the data. Next, use the `shutdown` command to disable the mirror endpoint.

Examples

Enabling a mirror endpoint:

```
switch(config)# mirror endpoint test
switch(config-mirror-endpoint-test)# no shutdown
```

Disabling a mirror endpoint:

```
switch(config)# mirror endpoint test
switch(config-mirror-endpoint-test)# shutdown
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

source

```
source <SOURCE-IP> destination <DESTINATION-IP> id <1-4294967295> [vrf <VRF_NAME>] [type
{gre}]
no source
```

Description

Configures tunnel parameters of the mirror endpoint. Configuring a tunnel parameter to a mirror endpoint will replace the existing configuration. By default the VRF is **default**, users can also explicitly provide a custom VRF. The default tunnel type is considered to be GRE and users also have the option to explicitly give type as GRE.

The **no** form removes the tunnel parameters of the mirror endpoint.

Parameter	Description
<SOURCE-IP>	Specifies L3 encapsulated IPv4 source in the form A.B.C.D.
<DESTINATION-IP>	Specifies L3 encapsulated IPv4 destination in the form A.B.C.D.
`id`	Specifies tunnel identifier from the encapsulated packet.
<VRF_NAME>	Specifies the name of VRF for which the tunnel belongs to.

Examples

Configuring a tunnel parameter to a mirror endpoint:

```
switch(config-mirror-endpoint-test)# source 1.1.1.1 destination 7.7.7.7 id 1 vrf
default type gre
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

source interface

```
source interface {<PORT-NUM> | <LAG-NAME>} [<DIRECTION>]
no source interface {<PORT-NUM> | <LAG-NAME>} [<DIRECTION>]
```

Description

Configures the specified interface (either an Ethernet port or a LAG) as a source of traffic to be mirrored.

The **no** form of this command ceases mirroring traffic from the specified source interface and removes the source interface from the mirroring session configuration.

Parameter	Description
<PORT-NUM>	Specifies a physical port on the switch. Use the format **member/slot/port** (for example, **1/3/1**).
<LAG-NAME>	Specifies the identifier for the LAG (link aggregation group).
<DIRECTION>	Selects the direction of traffic to be mirrored from this source interface. There is no default for this parameter. Valid values are the following:
`both`	Mirror both transmitted and received packets.
`rx`	Mirror only received packets.
`tx`	Mirror only transmitted packets.

Usage

There is a limit of source interfaces in each direction of a given mirror session:

Switch	Source interface limit per mirror session (4 possible sessions)
6300	64
6400	64

However, there is a practical limit to the amount of traffic that a mirror destination can transmit. For example, mirroring session with multiple 10G sources can overwhelm a single 10G destination.

When adding, removing, or changing the configuration of a source port in an enabled mirroring session, packets from other mirror sources using the same destination port might be interrupted.

Examples

Configuring a mirrored traffic source interface:

```
switch(config-mirror-1)# source interface
  LAG-NAME      Enter a LAG name. For example, lag10
  PORT-NUM      Enter a port number
```

Creating a mirroring session and configuring a source interface to mirror both transmitted and received packets:

```
switch(config)# mirror session 1
switch(config-mirror-1)# source interface 1/1/1 both
```

Creating a second mirroring session and configuring two source interfaces. One port mirroring only transmitted packets and the other mirroring both transmitted and received packets:

```
switch(config)# mirror session 2
switch(config-mirror-2)# source interface 1/1/3 tx
switch(config-mirror-2)# source interface 1/2/1 both
```

Removing the first source interface:

```
switch(config-mirror-2)# no source interface 1/2/3
```

Configuring a source interface to mirror received packets only:

```
switch(config-mirror-3)# source interface 1/1/2 rx
```

Configuring a source interface to mirror both transmitted and received packets:

```
switch(config-mirror-1)# source interface 1/1/1 both
```

Configuring a LAG as source interface to mirror both transmitted and received packets:

```
switch(config-mirror-4)# source interface lag1 both
```

Stopping the mirroring of received packets from a configured source interface:

```
switch(config-mirror-4)# no source interface lag1 rx
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-mirror-<SESSION-ID>`	Administrators or local user group members with execution rights for this command.

source vlan

```
source vlan <VLAN-NUM> {rx | tx | both}
no source vlan <VLAN-NUM> {rx | tx | both}
```

Description

Mirroring with VLAN as a source is supported in the following traffic directions:

- **both** - traffic received and transmitted
- **rx** - only received traffic
- **tx** - only transmitted traffic

More than one source VLAN can be configured in a mirror session. Each such VLAN may specify its own direction.

There is a limit of 1024 source VLANs for a given mirror session. There is also a limit of 4096 source VLANs across all mirror sessions.

Same VLAN can be configured as a mirror source for multiple sessions.

> When changing a source VLAN in an enabled mirror session (i.e. adding, changing direction, or removing) mirrored packets being transmitted out of the mirror destination port from other mirror sources may be briefly interrupted during the reconfiguration.

Direction of an existing source VLAN can be updated in one of two ways.

- Reenter the **source vlan <VLAN-NUM> <direction>** command with the new preferred direction.
- Use the **no source vlan <VLAN-NUM> <direction>** form of the command with a direction (**rx** or **tx**) to selectively remove the specified direction.

Specifying the last remaining direction for that VLAN will remove the VLAN from the configuration entirely.

Mirroring allows configuration of VLAN as a source. When VLAN source is configured in the **rx** direction, all packets are mirrored as they are received in the switch. When VLAN source is configured in **tx** direction, all packets are mirrored as they are transmitted out of the switch.

For packets bridged through the switch:

- If the mirror is configured in 'both' direction, two copies of packets are mirrored, otherwise one copy of the packet will be mirrored.

For routed packets:

- If the mirror is configured in **rx** direction, packets are mirrored in the pre-routed form with the Destination MAC address as the switch address.
- If the mirror is configured in **tx** direction, packets are mirrored in post-routed form with the source MAC as the switch address. Destination MAC is the nexthop gateway or station.
- If the mirror is configured in **both** direction, one copy of the packet will be mirrored.

Control plane packets generated by the switch's CPU are processed both in theingress and the egress packet processing pipeline. The following are the behavior for mirroring with VLAN as source:

- If the mirror is configured in the **rx** or **tx** direction, the packets are mirrored to the mirror destination.
- If the mirror is configured in the **both** direction, two copies of the packets are mirrored to the mirror destination.

The **no** form command will cease mirroring traffic from the specified source VLAN and remove the source from the mirror configuration.

Parameter	Description
`VLAN-NUM`	Selects the VLAN number.
`direction`	Specifies the direction of mirroring. **tx** (transmit), **rx** (receive), or **both**.

Examples

Creating a mirror session and adding a VLAN as a source of traffic in both directions on that port:

```
switch# configure terminal
switch(config)# mirror session 1
switch(config-mirror-1)# source vlan 10 both
```

Creating a mirror session and adding two VLANs as sources of traffic:

directions:

```
switch# configure terminal
switch(config)# mirror session 2
switch(config-mirror-2)# source vlan 10 tx
switch(config-mirror-2)# source vlan 20 both
```

Configuring the source in session 2 to receive by specifying the source interface configuration:

```
switch(config-mirror-2)# source vlan 10 rx
```

Removing the first source interface in session 2 entirely, and removing the transmit direction from the other so that mirroring only occurs in the receive direction:

```
switch(config-mirror-2)# source vlan 10 rx
switch(config-mirror-2)# source vlan 20 tx
```

Showing maximum of 1024 mirror source VLANs allowed:

```
switch(config-mirror-2)# source vlan 2000 rx
The maximum number of source VLANs per mirror session is 1024 in each direction
```

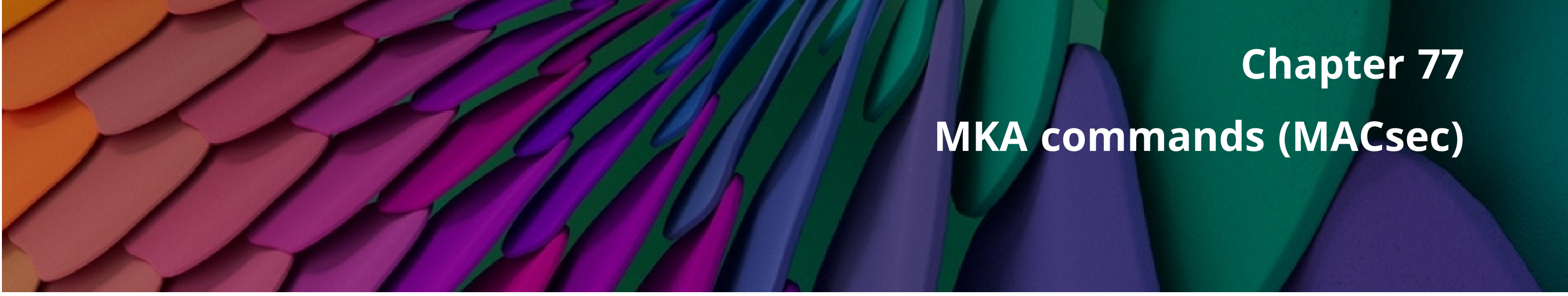
For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.



Chapter 77

MKA commands (MACsec)

apply mka policy

```
apply mka policy <MKA-POLICY-NAME>
no apply mka policy
```

Description

Within the selected interface context, applies the specified MKA policy to the selected port. To start the MKA protocol on the port, a MACsec policy must also be applied to the port.

> An MKA policy can be applied to a physical interface port that is not part of any LAG ports or to a lag port. It can also be applied to an interface that is configured as an MCLAG, VSX keep-alive, or VSX inter-switch-link.

If an MKA policy is already applied to the selected port, this command replaces the existing policy application.

The **no** form of this command dissociates the specified policy from the port.

Parameter	Description
<MKA-POLICY-NAME>	Specifies the MKA policy name. Range: 1 to 32 alphanumeric characters including only the three special characters "." (period), "-" (hyphen), and "_" (underscore).

Usage

- When any MACsec or MKA policy parameter is updated, any active MACsec session on all interfaces running the MACsec or MKA policy is terminated and restarted. This is indicated with the following prompt that provides an opportunity to not execute the **apply** command.

```
This policy is currently in use by one or more interfaces.
Updating the policy will cause existing MACsec sessions using
the policy to restart.
Continue (y/n)?
```

- For non-LAG ports, a range of ports can be specified in the **interface** command used to enter the interface context. For example, entering the interface context for ports 1/1/1 through 1/1/4:

```
switch(config)# interface 1/1/1-1/1/4
switch(config-if-<1/1/1-1/1/4>)# apply mka policy MKA_Policy1
```

- Not all interfaces on a switch may support the MACsec capability. An error will be generated when a policy is applied to a physical interface that is not capable of MACsec. For LAG ports, any non-MACsec capable interfaces that are part of the LAG will be blocked.

Examples

Applying an MKA policy to a range of two ports:

```
switch(config)# interface 1/1/1-1/1/2
switch(config-if-<1/1/1-1/1/2>)# apply mka policy MKA_Policy1
```

Attempting to apply an MKA policy to a port that is not MACsec capable:

```
switch(config)# interface 1/1/25
switch(config-if)# apply mka policy MKA_Policy1

MACsec is not supported on the interface.
switch(config-if)#
```

Removing MKA policy association from a port:

```
switch(config)# interface 1/1/1
switch(config-if)# no apply mka policy
```

Applying an MKA policy to a LAG port:

```
switch(config)# interface lag 1
switch(config-if)# apply mka policy MKA_Policy1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights for this command.

clear mka statistics

```
clear mka statistics [interface <IF-RANGE>]
```

Description

Clears MKA statistics on all MACsec-enabled interfaces or on a specific interface or interface range. MKA statistics are cleared for the entire switch rather than just in the current user session.

Parameter	Description
`interface <IF-RANGE>`	Specifies one or more interfaces (ports) for which MKA statistics information is to be cleared.

Examples

Clearing MKA statistics on an interface range:

```
switch# clear mka statistics interface 1/1/1-1/1/4
```

Clearing MKA statistics on all MACsec-enabled interfaces:

```
switch# clear mka statistics
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

data-delay-protection

```
data-delay-protection
no data-delay-protection
```

Description

Configures the MACsec policy to use data delay protection. Data delay protection allows MKA participants to ensure that the data frames protected by MACsec are not delayed by more than 2 seconds.

Enabling data delay protection necessitates transmission of MKPDUs at a frequency of 0.5 second to meet a maximum data delay of 2 seconds while minimizing connectivity interruption due to the possibility of lost or delayed MKPDUs.

Data delay protection should be enabled only when there is a need to drop MACsec protected frames that are delayed by more than 2 seconds on the wire. It is recommended to not enable data delay protection unless absolutely required as it adds extra load on the system.

Disabled by default.

When data delay protection is enabled, a default of 0.5 second is used as transmit-interval and transmit-interval configuration under MKA policy is ignored.

Examples

Enabling data delay protection:

```
switch(config)# macsec policy Aggregator-Connect data-delay-protection
```

or

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# data delay protection
```

Disabling data delay protection:

```
switch(config)# no macsec policy Aggregator-Connect data-delay-protection
```

or

```
switch(config)# macsec policy Aggregator-Connect
switch(config-macsec-policy)# no data delay protection
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config` `config-macsec-policy`	Administrators or local user group members with execution rights for this command.

eapol-destination-mac

```
eapol-destination-mac <MAC-ADDRESS>
no eapol-destination-mac <MAC-ADDRESS>
```

Description

Configures the destination MAC address to use in EAPoL frames for MKA. When not configured, the switch uses the default EAPoL multicast address (01:80:C2:00:00:03) for MKA.

The **no** form of the command configures the switch to use the default EAPoL multicast address for MKA.

Parameter	Description
<MAC-ADDRESS>	Specifies the EAPoL destination MAC address for MKA.

Examples

Configuring the broadcast MAC as EAPoL destination address:

```
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# eapol-destination-mac ff:ff:ff:ff:ff:ff
OR
switch(config)# mka policy Agg-To-Agg eapol-destination-mac ff:ff:ff:ff:ff:ff
```

Resetting MKA policy to use untagged EAPoL MKA frames:

```
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# no eapol-destination-mac
OR
switch(config-if)# no mka policy Agg-To-Agg eapol-destination-mac
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command introduced on the 6400 Switch Series.
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	config-if config-mka-policy	Administrators or local user group members with execution rights for this command.

eapol-dot1q-tagged

```
eapol-dot1q-tagged
no eapol-dot1q-tagged
```

Description

Configures the EAPoL frames for MKA to be transmitted with an 802.1q tag. The native VLAN associated with the port is used in the MKA frames. This configuration enables the switch to establish a MACsec tunnel over a Layer 2 network with the next hop connected over non-MACsec, 802.1q tagged only link.

The **no** form of command configures the switch to send MKA frames as untagged.

- When the configuration is enabled, MKA is restarted on the port if the native VLAN associated with the port is updated.
- The 802.1q tag added to the MKA frame is also used in the computation of the ICV for the MKA frame. If the 802.1q tag is removed or modified in any way along the path, including changes in VLAN ID or PCP, the MKA frame will be discarded at the destination.

Examples

Configuring the MKA policy to use 802.1q tagged EAPoL MKA frames:

```
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# eapol-dot1q-tagged
OR
switch(config)# mka policy Agg-To-Agg eapol-dot1q-tagged
```

Resetting MKA policy to use untagged EAPoL MKA frames:

```
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# no eapol-dot1q-tagged
OR
switch(config-if)# no mka policy Agg-To-Agg eapol-dot1q-tagged
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command introduced on the 6400 Switch Series.
10.13	Command introduced on the 8360 and 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-mka-policy`	Administrators or local user group members with execution rights for this command.

eapol-eth-type

```
eapol-eth-type <ETH-TYPE>
no eapol-eth-type <ETH-TYPE>
```

Description

Configures the Ether-Type for use in frames for MKA.

The **no** form of the command uses the default EAPoL ether-type 0x888e for MKA.

- Only values 0x876f and 0x888e are supported.
- Refer to the MACsec WAN extension

Parameter	Description
<ETH-TYPE>	Configures the Ether-Type in EAPoL frames for MKA.

Examples

Configuring the custom Ethernet type for MKA:

```
switch(config)# mka policy Agg-To-Agg eapol-eth-type 876f
OR
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# eapol-eth-type 876f
```

Resetting the custom EAPoL Ethernet Type:

```
switch(config)# no mka policy Agg-To-Agg eapol-eth-type 876f
OR
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# no eapol-eth-type 876f
```

Using an Ethernet Type value other than 876f or 888e:

```
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# eapol-eth-type 999F
Unsupported Ether-Type. Supported values are 888e and 876f
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.14	Command introduced on the 6300, 6400, and 8360 Switch Series.

Command Information

Platforms	Command context	Authority
6300 6400	`config-mka-policy`	Administrators or local user group members with execution rights for this command.

key-server-priority

`key-server-priority` *<PRIORITY>*

```
no key-server-priority
```

Description

In the **config-mka-policy** policy context, configures the MKA key server priority. The highest priority is 0 and indicates that this switch strongly wants to be the MKA key server. The lowest priority is 255 and indicates that switch does not want to be the MKA key server, allowing the switch at the other end of the link to be the key server. Set this priority on the switches at either end of the link to achieve the desired effect.

If the key server priority is 0 on both switches then the switch with the lowest system MACsec address is elected as key server.

The **no** form of this command resets the MKA key server priority to its default of 0.

Parameter	Description
<PRIORITY>	Selects the MKA key server priority for this switch. Default 0 (highest priority). Range: 0 to 255.

Examples

Setting the MKA key server priority:

```
switch(config-mka-policy)# key-server-priority 5
```

Resetting the MKA key server priority to its default of 0:

```
switch(config-mka-policy)# no key-server-priority
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-mka-policy`	Administrators or local user group members with execution rights for this command.

pre-shared-key

```
pre-shared-key keychain <NAME>
pre-shared-key ckn <CA-KEY-NAME> cak {plaintext [<PLAINTEXT-CAK>] | ciphertext
<CIPHERTEXT-CAK>}
```

Description

Configures the Pre-Shared Key (PSK) to use for an MKA policy.

A PSK can be configured one of two ways:

1. Configure the Connectivity Association Key Name (CKN) and Connectivity Association Key (CAK) directly in the PSK.
2. Configure the PSK to use an existing keychain for the CKN (key name) and CAK (key-string).

If both a key chain and a static CKN/CAK are configured in the PSK, then the key chain will be used for MKA operations.

When using a PSK with a key chain, only the send lifetime is considered for CAK lifetime. It is recommended to not configure an accept lifetime in the key chain used for MACsec.

The **no** form of this command deletes the PSK configuration including the key chain association, the CKN and the CAK.

Parameter	Description
<CA-KEY-NAME>	Specifies the CKN (Connectivity Association Key Name). Range: 1 to 64 hexadecimal characters.
<PLAINTEXT-CAK>	Specifies the CAK (Connectivity Association Key) in plaintext. Range: 1 to 64 hexadecimal characters.
<CIPHERTEXT-CAK>	Specifies the CAK (Connectivity Association Key) as ciphertext.
<NAME>	Specifies the keychain name.

Examples

Configuring the pre-shared key with a specified plaintext CAK:

```
switch(config-mka-policy)# pre-shared-key ckn abcdef12 cak plaintext 123abcdef
```

Configuring the pre-shared key with a prompted plaintext CAK:

```
switch(config-mka-policy)# pre-shared-key ckn abcdef12 cak plaintext
Enter CAK: ******
Confirm CAK: ******
```

Configuring the pre-shared key with a ciphertext CAK:

```
switch(config-mka-policy)# pre-shared-key ckn abcdef12 cak ciphertext
AQBapUvjDZgUxtTpgA4NLqnsn7CjXqbDch+BOS7y9fcWExLUBgAAAKUmDYdhew==
```

Configuring a key chain for an MKA policy:

```
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# pre-shared-key keychain macsec_keys
```

Deleting the PSK configuration including its CKN and CAK:

```
switch(config-mka-policy)# no pre-shared-key
```

Deleting a key chain from an MKA policy:

```
switch(config)# mka policy Agg-To-Agg
switch(config-mka-policy)# no pre-shared-key keychain macsec_keys
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-mka-policy`	Administrators or local user group members with execution rights for this command.

mka policy

```
mka policy  <MKA-POLICY-NAME>
no mka policy <MKA-POLICY-NAME>
```

Description

Creates the specified MKA (MACsec Key Agreement) policy and then enters its context (displayed in the CLI as **config-mka-policy**). If the MKA policy already exists, this command enters the specified MKA policy context.

An MKA policy can be applied to one or more switch ports, enabling MKA on the ports. A MACsec policy must be applied to the same ports.

The **no** form of this command deletes the MKA policy.

An MKA policy cannot be deleted if it is currently applied to any ports. All application of the policy must be removed before the policy can be deleted.

Parameter	Description
<MKA-POLICY-NAME>	Specifies the MKA policy name. Range: 1 to 32 alphanumeric characters including only the three special characters "." (period), "-" (hyphen), and "_" (underscore).

Examples

Creating an MKA policy:

```
switch(config)# mka policy MKA_Policy1
switch(config-mka-policy)#
```

Deleting an MKA policy (the policy cannot be currently applied to any ports):

```
switch(config)# no mka policy MKA_Policy1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.

show mka policy

`show mka policy [<MKA-POLICY-NAME>]`

Description

Shows information for one or all MKA policies.

Parameter	Description
<MKA-POLICY-NAME>	Specifies the MKA policy name. Range: 1 to 32 alphanumeric characters including only the three special characters "." (period), "-" (hyphen), and "_" (underscore).

Examples

Showing information for a specific MKA policy:

```
switch# show mka policy Agg-To-Agg

MKA Policy Details

  Policy Name: Agg-To-Agg
  ----------------------------------------------------------------------------
  Mode                     : Pre-shared key
  CKN                      : abcdef123456
  CAK (encrypted)          :
AQBapUwNK5Uf+r1vmhBIncQPw1YPVH0V1nYr7Yjm/bPn3bBVCgAAAHFKt8mcSv/A/g8=
  Keychain                    : macsec_keys
  EAPoL Destination MAC       : ff:ff:ff:ff:ff:ff
  EAPoL 802.1q Tag            : Enabled
  Key-server Priority         : 5
  Transmit Interval           : 6 seconds
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command introduced on the 6400 Switch Series.
10.13	Command updated to display **EAPoL Destination MAC** and **EAPoL 802.1q Tag** in the output.
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mka statistics

`show mka statistics [interface <IF-RANGE>]`

Description

Shows MKA statistics for all MACsec-enabled interfaces or a specific interface or interface range. The MKA statistics are refreshed periodically, approximately every five seconds.

Parameter	Description
`interface <IF-RANGE>`	Specifies one or more interfaces for which MKA statistics information is to be shown.

Examples

Showing MKA statistics information for a specific interface:

```
switch# show mka statistics interface 1/1/1


Interface 1/1/1
================

  KaY
  ----
    SCI : ec0273f72f4d0001

    Statistics
    -----------
      MKPDUs With Invalid Version : 0
      MKPDUs With Invalid CKN     : 0

    Participant
    ------------
      CKN : 1234567890

      Statistics
      -----------
        Tx MKPDUs                 : 33834
        Rx MKPDUs                 : 35375
        SAKs Distributed          : 1
        SAKs Received             : 0
        MKPDUs With Invalid ICV   : 0
        MKPDUs With Duplicate MI  : 0
        MKPDUs With Invalid MN    : 0
...
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mka status

Shows MKA status information for all MACsec-enabled interfaces or a specific interface or interface range.

`show mka status [interface <IF-RANGE>]`

Description

Parameter	Description
`interface <IF-RANGE>`	Specifies one or more interfaces for which MKA status information is to be shown.

Examples

Showing MKA status information for a specific interface (Pre-shared key):

```
switch# show mka status interface 1/1/1

MKA Protocol Status

Interface 1/1/1
================

KA Port Identifier     : 1
MKA Policy Name        : Agg-To-Agg
MKA Session Status     : Secured
Mode                   : Pre-shared key
CKN                    : abcdef123456
CAK (encrypted)        :
AQBapUwNK5Uf+r1vmhBIncQPw1YPVH0V1nYr7Yjm/bPn3bBVCgAAAHFKt8mcSv/A/g8=
Keychain               : macsec_keys
Member Identifier      : 1c64f054f894b5482defdf81
Message Number         : 86
Capability             : Conf, Offset 0
EAPoL Destination MAC  : ff:ff:ff:ff:ff:ff
EAPoL 802.1q Tagged    : Enabled
Transmit Interval      : 6 seconds
Key Server Priority    : 5
Key Server             : No

Live Peer List:
MI                       MN       PRI Capability            Rx-SCI
------------------------ -------- --- --------------------- ----------------
fb7f82788e4cd38dbc65dc55 119      16  IC, Conf, Offset 0    a45d36489bfe0002

Potential Peer List:
MI                       MN       PRI Capability            Rx-SCI
------------------------ -------- --- --------------------- ----------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command introduced on the 6400 Switch Series.
10.13	Command updated to display **EAPoL Destination MAC** and **EAPoL 802.1q Tagged** in the output.
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

transmit-interval

```
transmit-interval <INTERVAL>
no transmit-interval
```

Description

In the **config-mka-policy** policy context, configures the MKA packet transmit interval.

The **no** form of this command resets the MKA packet transmit interval to its default of 2 seconds.

Parameter	Description
<INTERVAL>	Selects the MKA packet transmit interval. Default 2 seconds. Range: 2 to 6 seconds.

Examples

Setting the MKA packet transmit interval:

```
switch(config-mka-policy)# transmit-interval 4
```

Resetting the MKA packet transmit interval to its default of 2 seconds:

```
switch(config-mka-policy)# no transmit-interval
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 6300.

Command Information

Platforms	Command context	Authority
6300	`config-mka-policy`	Administrators or local user group members with execution rights for this command.

Chapter 78

MLD snooping global configuration commands

ipv6 mld snooping

```
ipv6 mld snooping drop-unknown {vlan-shared | vlan-exclusive}
no ipv6 mld snooping drop-unknown {vlan-shared | vlan-exclusive}
```

Description

This command configures the drop unknown mode. While MLD snooping is enabled, the traffic will be forwarded only to ports that initiate an MLD request for multicast. Drop unknown mode can be a filter across all VLANs (vlan-shared) or per VLAN (exclusive-vlan). The default configuration is vlan-shared.

The **no** form of this command configures the drop unknown mode on the switch to the default **vlan-shared**.

Parameter	Description
`vlan-shared`	Required: Enable shared VLAN filter on the switch.
`vlan-exclusive`	Required: Enable exclusive drop unknown filter per VLAN.

Example

```
switch(config)# ipv6 mld snooping drop-unknown vlan-shared
switch(config)# ipv6 mld snooping drop-unknown vlan-exclusive
switch(config)# no ipv6 mld snooping drop-unknown
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

mgmd delayed-refresh timer

```
mgmd delayed-refresh timer <value>
no mgmd delayed-refresh timer <value>
```

Description

This command delays the refresh for some IGMP or MLD protocol-related values. When this command is enabled, IGMP/MLD **last_reporter value**, source, group, or querier uptime, and the **create time** and **expiry time** values will be updated based on the configured timer values. By default, the timer value is 30 seconds. This command is disabled by default, where the values listed above will be updated for every control packet. Best practices is to enable this feature when CPU utilization by the OVSDB server is increasing because of increased MGMD operations.

Parameter	Description
timer <value>	Number of seconds the timer will delay the update. Range: 5-30.

Example

Configuring the MGMD delayed refresh.

```
switch(config)# mgmd delayed-update timer 20
```

Disabling the MGMD delayed refresh.feature:

```
switch(config)# no mgmd delayed-update timer 20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced

Command Information

Platforms	Command context	Authority
6400	config	Administrators or local user group members with execution rights for this command.

mgmd querier-offload

```
mgmd querier-offload
no mgmd querier-offload
```

Description

Configures the IGMP/MLD querier (mgmd) offload feature. When the querier offload is enabled, during VSX software upgrade or VSX querier node reboot, the querier responsibility is offloaded to the VSX peer which is up and running. This is enabled by default.

The **no** form of this command disables the querier offload functionality.

This feature is applicable only to the VSX switches not to standalone switches.

Example

Configuring the querier offload feature:

```
switch(config)# mgmd querier-offload
```

Disabling the querier offload feature:

```
switch(config)# no mgmd querier-offload
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced

Command Information

Platforms	Command context	Authority
6400	`config`	Administrators or local user group members with execution rights for this command.

Chapter 79

MLD snooping VLAN configuration commands

ipv6 mld snooping

```
ipv6 mld snooping {enable | disable}
no ipv6 mld snooping [enable | disable]
```

Description

This command enables or disables MLD snooping on the VLAN.

The **no** form of this command disables all MLD snooping configurations on the VLAN.

Parameter	Description
`enable`	Required: Enable MLD snooping on the VLAN.
`disable`	Required: Disable MLD snooping on the VLAN.

Example

Enable MLD snooping on VLAN 2:

```
switch(config)# vlan 2
switch(config-vlan)# ipv6 mld snooping enable
switch(config-vlan)# ipv6 mld snooping disable
```

Remove all MLD snooping configurations on VLAN 2:

```
switch(config)# vlan 2
switch(config-vlan)# no ipv6 mld snooping enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping fastlearn

```
ipv6 mld snooping fastlearn <port-list>
```

Description

This command enables the port to learn group information on receiving topology change notification.

The **no** form of this command disables fastlearn on the ports.

Parameter	Description
`port-list`	Required: 1/1/1-1/1/2, ports to be configured as fastlearn ports.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# ipv6 mld snooping fastlearn 1/1/3
switch(config)# ipv6 mld snooping fastlearn 1/1/1-1/1/2
switch(config)# ipv6 mld snooping fastlearn 1/1/5,1/1/6
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping fastleave vlan

```
ipv6 mld snooping [fastleave vlan <VLAN-LIST>]
no ipv6 mld snooping [fastleave vlan <VLAN-LIST>]
```

Description

Configures the specified ports as fastleave ports. Enables the switch to immediately remove an interface from the bridge table upon receiving the leave group message.

The **no** form of this command disables fastleave configuration on the ports.

Parameter	Description
<VLAN-LIST>	Required: Specifies a list of VLANs on which the port should be configured as a fastleave port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).

Usage

MLD fastleave is configured for ports on a per-VLAN basis. By default, the querier sends a MLD Group-Specific Query message out of the interface, upon which the leave group message is received to ensure that no other receivers are connected to the interface. If receivers are directly attached to the switch, it is inefficient to send the membership query as the receiver wanting to leave is the only connected host. Fastleave processing eliminates the MLD Group-Specific Query message. Thus, it allows the switch to immediately remove an interface from the bridge table upon receiving the leave Group message. This processing speeds up the overall leave process and also eliminates the CPU overhead of having to generate an MLD Group-Specific Query message.

Example

On the 6400 Switch Series, interface identification differs.

Configuring fastleave ports for the VLAN:

```
switch# configure terminal
switch(config)# int 1/1/1
switch(config-vlan)# no shut
switch(config-vlan)# no routing
switch(config-vlan)# ipv6 mld snooping fastleave vlan 10
switch(config-vlan)# ipv6 mld snooping fastleave vlan 10-20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping filter-unknown-mcast

```
ipv6 mld snooping filter-unknown-mcast
no ipv6 mld snooping filter-unknown-mcast
```

Description

Configures the unknown multicast to steal when the MLD snooping is enabled.

The **no** form of this command returns to the default behavior of initial flooding of unknown multicast traffic.

Usage

In the default behavior, the unknown multicast traffic is flooded until the IP Multicast Flow programming is done on the hardware. This is known as initial flooding of unknown multicast. Use this command to filter unknown multicast instead of flooding.

> Initial flooding of multicast traffic is observed for a few seconds after the device comes up from a reboot. This issue is only seen when the multicast source connected device is rebooted. Once the device is up after a reboot, it takes a few seconds for the CPU Rx rule to be programmed during the timeframe that the initial flooding is observed. This is an expected behavior.

Example

Configure the unknown multicast to steal globally on IGMP snooping enabled VLANs.

```
switch# configure terminal
switch(config)# ipv6 mld snooping filter-unknown-multicast
```

Removing the configuration of the unknown multicast to steal globally on IGMP snooping enabled VLANs.

```
switch# configure terminal
switch(config)# no ipv6 mld snooping filter-unknown-multicast
```

Command History

Release	Modification
10.11	Command introduced on the 6200, 6300, 6400, 8100, and 8360.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping forced fastleave vlan

```
ipv6 mld snooping [forced-fastleave <VLAN-LIST>]
no ipv6 mld snooping [forced-fastleave <VLAN-LIST>]
```

Description

Configures the given ports in forced fastleave mode.

The **no** form of this command disables forced fastleave configuration on the ports.

Parameter	Description
<VLAN-LIST>	Required: Specifies a list of VLANs on which the port should be configured as a forced fastleave port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).

Usage

With forced fastleave enabled, MLD speeds up the process of blocking unnecessary multicast traffic to a switch port that is connected to multiple end nodes. When a port having multiple end nodes receives a leave group request from one end node for a given multicast group, forced fastleave activates and waits a small amount of time to receive a join request from any other member of the same group on that port. If the port does not receive a join request for that group within the forced fastleave interval, the switch then blocks any further traffic to that group on that port.

Example

On the 6400 Switch Series, interface identification differs.

Configuring forced-fastleave ports for the VLAN:

```
switch# configure terminal
switch(config)# int 1/1/1
switch(config-vlan)# no shut
switch(config-vlan)# no routing
switch(config-vlan)# ipv6 mld snooping forced-fastleave vlan 10
switch(config-vlan)# ipv6 mld snooping forced-fastleave vlan 10-20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping apply access-list

```
ipv6 mld snooping apply access-list <ACL-NAME>
no ipv6 mld snooping apply access-list <ACL-NAME>
```

Description

Configures the ACL on a particular interface to filter the MLD join or leave packets based on rules set in the particular ACL name.

The **no** form of this command disables the rules set for the ACL.

This configuration will override the ACL associated with IGMP snooping on the corresponding L2 VLAN.

Parameter	Description
`access-list`	Associates an ACL with the IGMP.
`<ACL-NAME>`	Specifies the name of the ACL. **NOTE:** If the access list is configured for both L2 VLAN and L3 VLAN, the L3 VLAN configuration will be applied.

Usage

- Existing classifier commands are used to configure the ACL.
- In case an IGMPv3 packet with multiple group addresses is received, the switch only processes the permitted group addresses based on the ACL rule set. The packet is forwarded to querier and PIM router even though one of the groups present in the packet is blocked by ACL. This avoids the delay in learning of the permitted groups. Since the access switch configured with ACL blocks the traffic for the groups which are denied, forwarding of joins has no impact. If all the groups in the packet are denied by the ACL rule, the packet is not forwarded to the querier and PIM router. Existing joins will timeout.
- In case of IGMPv2, if there is no match or if there is a deny rule match, the packet is dropped.

Examples

Configuring the ACL to filter MLD packets based on permit/deny rules set in access list **mygroup**:

```
switch(config)# access-list ipv6 mygroup
switch(config-acl-ip)# 10 deny icmpv6 any ff55::2
switch(config-acl-ip)# 20 deny icmpv6 any ff55::3
switch(config-acl-ip)# 30 permit icmpv6 any ff55::1
switch(config-acl-ip)# exit
switch(config)# interface vlan 2
switch(config-vlan)# ipv6 mld snooping apply access-list mygroup
```

Configuring the ACL to remove the rules set in access list `mygroup`:

```
switch(config-vlan)# no ipv6 mld snooping apply access-list mygroup
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping auto vlan

```
ipv6 mld snooping [auto vlan <VLAN-LIST>]
no ipv6 mld snooping [auto vlan <VLAN-LIST>]
```

Description

This command configures the given ports in auto mode, which is the default port mode.

The **no** form of this command disables auto ports.

Parameter	Description
<VLAN-LIST>	Required: Specifies a list of VLANs on which the port should be configured as an auto port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).

Example

On the 6400 Switch Series, interface identification differs.

Configuring auto ports for VLANs on the interface:

```
switch# configure terminal
switch(config)# int 1/1/1
switch(config-vlan)# no shut
switch(config-vlan)# no routing
switch(config-vlan)# ipv6 mld snooping auto vlan 10
switch(config-vlan)# ipv6 mld snooping auto vlan 10-20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping blocked vlan

```
ipv6 mld snooping [blocked vlan <VLAN-LIST>]
no ipv6 mld snooping [blocked vlan <VLAN-LIST>]
```

Description

By default ports are configured in auto mode. This command configures the given ports in blocked mode.

The **no** form of this command removes blocked ports.

Parameter	Description
<VLAN-LIST>	Required: Specifies a list of VLANs on which the port should be configured as a blocked port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).

Example

On the 6400 Switch Series, interface identification differs.

Configuring blocked ports for the VLANs on the interface:

```
switch# configure terminal
switch(config)# int 1/1/1
switch(config-vlan)# no shut
switch(config-vlan)# no routing
switch(config-vlan)# ipv6 mld snooping blocked vlan 10
switch(config-vlan)# ipv6 mld snooping blocked vlan 10-20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping forward vlan

```
ipv6 mld snooping [forward vlan <VLAN-LIST>]
no ipv6 mld snooping [forward vlan <VLAN-LIST>]
```

Description

By default ports are configured in auto mode. This command configures the given ports in forward mode.

The **no** form of this command disables forward ports.

Parameter	Description
<VLAN-LIST>	Required: Specifies a list of VLANs on which the port should be configured as a forward port. Specifies the number of a single VLAN or a series of numbers for a range of VLANs, separated by commas (10, 20, 30, 40), dashes (10-40), or both (10-40,60).

Example

On the 6400 Switch Series, interface identification differs.

Configuring forward ports for VLANs on the interface:

```
switch# configureterminal
switch(config)# int 1/1/1
switch(config-vlan)# no shut
switch(config-vlan)# no routing
switch(config-vlan)# ipv6 mld snooping forward vlan 10
switch(config-vlan)# ipv6 mld snooping forward vlan 10-20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping preprogram-starg-flow

`ipv6 mld snooping preprogram-starg-flow {enable | disable}`

Description

This command configures the preprogramming of the starg flow feature on MLD snooping enabled VLANs.

Parameter	Description
`enable`	Enable preprogramming starg flows on the VLAN.
`disable`	Disable prprogramming starg flows on the VLAN.

Usage

When this feature is enabled, a summarized multicast bridge entry is programmed into the hardware table when a starg or sg MLD join is received on the MLD snooping enabled VLAN. This enables multicast flow to be programmed in the hardware even before the data packet arrives for multicast flow. MLDv2 joins that are sent for a specific source are treated similar to starg joins and a summarized entry is programmed in the corresponding hardware.

Preprogramming of Starg Flows is supported only on the MLD snooping enabled VLANs. If MLD snooping is disabled on a VLAN, this feature is auto-disabled.

This feature is currently supported for MLDv1 and MLDv2 joins, which means a summarized multicast flow is programmed in advance when a MLDv1 or MLDv2 join for a specific group is received. For MLDv2 deployments, traffic from all of the sources for a specific multicast group are sent to all of the clients, regardless of whether they are sending MLDv1 or MLDv2 joins for this group. Keeping this feature disabled is recommended on VLANs where traffic from the specific source is only expected for the MLDv2 clients.

On the 6200, 6300, 6400, and 8100 switch series, a single starg entry is programmed in advance for each join received. Data driven programming of SG entries does not occur when traffic is received from a specific source for this group. A single starg entry is used to forward the traffic to the clients for all of the active joins in the feature enabled VLANs.

When an unknown multicast packet is received on a VLAN where the feature is enabled, it triggers programming of a starg entry in the hardware instead of SG.

It is highly recommended to not enable this feature on devices where PIM or L3 multicast routing is enabled as it can lead to issues like permanent traffic loss.

Configuring this feature on devices where there are multiple sources sending traffic for the same group address is recommended.

This feature is mutually exclusive with the MLD snooping static group feature.

Optimization may vary environment to environment, based on scale.

Example

Enable preprogramming of starg flow on VLAN 2:

```
switch(config)# vlan 2
switch(config-vlan)# ipv6 mld snooping preprogramming-starg-flow enable
```

Remove all preprogramming of starg flow on VLAN 2:

```
switch(config)# vlan 2
switch(config-vlan)# ipv6 mld snooping preprogramming-starg-flow disable
```

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping static-group

```
ipv6 mld snooping [static-group <X:X::X:X>]
no ipv6 mld snooping [static-group <X:X::X:X>]
```

Description

This command configures static multicast group.

The **no** form of this command disables static multicast group.

Parameter	Description
`static-group`	Required: **<X:X::X:X>**, MLD static multicast group.

Example

Configuring static multicast group:

```
switch(config)# vlan 2
switch(config-vlan)# ipv6 mld snooping static-group ff12::c
```

Removing the configuration of static multicast group:

```
switch(config)# vlan 2
switch(config-vlan)# no ipv6 mld snooping static-group ff12::c
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

ipv6 mld snooping version

```
ipv6 mld snooping [version <ver>]
no ipv6 mld snooping [version <ver>]
```

Description

This command configures the MLD snooping version on the VLAN. MLD version 2 is the default.

The **no** form of the command configures the default MLD snooping version on the VLAN, **2**.

Parameter	Description
`ver`	Required: 1-2, MLD snooping version.

Example

```
switch(config)# vlan 2
switch(config-vlan)# ipv6 mld snooping version 2
```

```
switch(config-vlan)# no ipv6 mld snooping version 2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

Chapter 80

MLD snooping show commands

show ipv6 mld snooping

```
show ipv6 mld snooping [vlan <vlan-id> [group <ip-addr>|{port <IF-NAME>}]
   counters
   detail
   groups vlan <vlan-id>
   no ...
   packet-exceptions
   static-groups
   statistics
   vsx-peer vlan [<vlan-id>]
```

NOTE: The `vsx-peer` parameter is not supported by the 6300 Series Switch

Description

This command shows MLD snooping details for all VLANs. Specify a VLAN ID or a VLAN and a group to display details for only that VLAN or VLAN group.

Parameter	Description
`vlan <vlan-id>`	Shows MLD snooping protocol information and number of different groups joined for the VLAN.
`group`	Shows MLD snooping details for the specified VLAN, including the number of different groups joined for the VLAN. Identify the group by IP address or interface name.
`<ip-addr>`	Dispaly MLD snooping information for the selected group IP address.
`port <IF-NAME>`	Display information for a VLAN port. Specify the port name in **member**/**slot**/**port** format.
`counters`	Shows MLD query packets transmitted (Tx), received (Rx), and error packet counters.
`detail`	Shows the total VLANs with MLD enabled. When issued with the **vlan <vlan-id>** parameter, this command displays details for the selected VLAN.
`groups`	Show MLD snooping groups information.
`vlan <vlan-id>`	Display IGMP snooping operational information for specified VLAN
`no ...`	Negates any configured parameter.
`packet-exceptions`	Troubleshoot issues in an L2 multicast bridge entries for data

Parameter	Description
	packets forwarded to the CPU.
statistics	Show MLD snooping statistics.

Examples

```
switch# show ipv mld snooping vlan 2 group port 1/1/1

VLAN ID    : 2
VLAN Name : VLAN2

Group Address : ff05::2:1
Last Reporter : fe80::1
Group Type    : Filter

                                        V1        Sources   Sources
Port      Vers Mode Uptime    Expires   Timer     Forwarded Blocked
--------- ---- ---- --------- --------- --------- --------- --------
1/1/1     2    INC  1m 46s    2m 34s              3         0

Group Address  : ff05::2:1
Source Address : 3000::1
Source Type    : Filter

Port      Mode Uptime    Expires   Configured Mode
--------- ---- --------- --------- ----------------
1/1/1     INC  1m 46s    2m 34s    Auto

Group Address  : ff05::2:1
Source Address : 3000::2
Source Type    : Filter

Port      Mode Uptime    Expires   Configured Mode
--------- ---- --------- --------- ----------------
1/1/1     INC  1m 46s    2m 34s    Auto

Group Address  : ff05::2:1
Source Address : 3000::3
Source Type    : Filter

Port      Mode Uptime    Expires   Configured Mode
--------- ---- --------- --------- ----------------
1/1/1     INC  1m 46s    2m 34s    Auto
```

```
switch# show ipv6 mld snooping counters
MLD Snooping VLAN Counters

Rx Counters :

V1 All Hosts Queries                             0
V2 All Hosts Queries                             0
V2 Group Specific Queries                        0
Group And Source Specific Queries                0
V1 Member Reports                                0
V2 Member Reports                                0
V1 Member Leaves                                 0
```

```
Tx Counters :

Flood on vlan                                    44
V1 Group Specific Queries                        0
V2 Group Specific Queries                        0

Errors:

Unknown Message Type                             0
Malformed Packets                                0
Bad Checksum                                     0
Packet received on MLD-disabled Interface        0
Interface Wrong Version Queries                  0
Packets dropped by ACL                           0

Port Counters:

Membership Timeout                               0
```

```
switch# show ipv6 mld snooping groups

MLD Group Address Information

VLAN ID Group Address     Expires   UpTime    Last Reporter                  Type
------- ----------------- --------- --------- ------------------------------ ----
10      ff12::c           3m 54s    0m 26s    2001::1
Filter
10      ff12::d           4m 17s    0m 3s     2001::1
```

```
switch# show ipv6 mld snooping vlan 2 statistics
MLD Snooping statistics

VLAN ID   :   2
VLAN Name :   VLAN2

Number of Include Groups       :   1
Number of Exclude Groups       :   0
Number of Static Groups        :   1
Total Multicast Groups Joined  :   2
```

```
switch# show ipv6 mld snooping packet-exceptions
List of L2 Multicast Bridge entries for which data packets are hitting CPU
Vlan   Group Address    Source-Address          Packet Count   Last Seen Time
----   --------------   -----------------       ------------   --------------
10     ff03::10/128     1010::10/128            19             01h:02m:05s
10     ff03::12/128     1010::11/128            30             00d:02h:01m
10     ff04::10/12      1010::10/128            40             01m:02w:03d
20     ff03::11/128     5000::10/128            20             02m:02w:00d
20     ff03::12/128     5000::10/128            41             0001y:01m:02w:05d
20     ff04::10/128     5000::10/128            30             00d:02h:02m
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	The **packet-exceptions** parameter is introduced.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mgmd debug-counters

```
show mgmd debug-counters
```

Description

This command displays packet throttle counters and packet queue sizes for IGMP/MLD debug counters.

Example

```
switch# show mgmd debug-counters
Global MGMD Debug Counters
Group Throttle Count                          : 0
Dropped Packet Count                          : 100
Max Pkt Handler Queue Depth                   : 2048
Current Pkt Handler Queue Depth               : 1000
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 81

MLD configuration commands for interface VLAN

ipv6 mld

```
ipv6 mld {enable | disable}
no ipv6 mld [enable | disable]
```

Description

This command enables or disables MLD on the interface VLAN.

The **no** form of this command disables MLD on the interface VLAN.

Parameter	Description
`enable`	Required: Enable MLD on the interface VLAN.
`disable`	Required: Disable MLD on the interface VLAN.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld enable
switch(config-if-vlan)# ipv6 mld disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld apply access-list

```
ipv6 mld apply access-list <ACL-NAME>
no ipv6 mld apply access-list <ACL-NAME>
```

Description

Configures the ACL on a particular interface to filter the MLD join or leave packets based on rules set in the particular ACL name.

The **no** form of this command disables the rules set for the ACL.

Parameter	Description
`access-list`	Associates an ACL with the IGMP.
`<ACL-NAME>`	Specifies the name of the ACL.

Usage

- Existing classifier commands are used to configure the ACL.
- In case an IGMPv3 packet with multiple group addresses is received, the switch only processes the permitted group addresses based on the ACL rule set. The packet is forwarded to querier and PIM router even though one of the groups present in the packet is blocked by ACL. This avoids the delay in learning of the permitted groups. Since the access switch configured with ACL blocks the traffic for the groups which are denied, forwarding of joins has no impact. If all the groups in the packet are denied by the ACL rule, the packet is not forwarded to the querier and PIM router. Existing joins will timeout.
- In case of IGMPv2, if there is no match or if there is a deny rule match, the packet is dropped.

Examples

Configuring the ACL to filter MLD packets based on permit/deny rules set in access list **mygroup**:

```
switch(config)# access-list ipv6 mygroup
switch(config-acl-ip)# 10 deny icmpv6 any ff55::2
switch(config-acl-ip)# 20 deny icmpv6 any ff55::3
switch(config-acl-ip)# 30 permit icmpv6 any ff55::1
switch(config-acl-ip)# exit
switch(config)# interface vlan 2
switch(config-vlan)# ipv6 mld apply access-list mygroup
```

Configuring the ACL to remove the rules set in access list **mygroup**:

```
switch(config-vlan)# no ipv6 mld apply access-list mygroup
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

no ipv6 mld

`no ipv6 mld`

Description

This command removes all MLD configurations on the interface.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# no ipv6 mld
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld querier

`ipv6 mld querier`

Description

This command configures MLD querier.

The **no** form of this command disables MLD querier.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld querier
switch(config-if-vlan)# no ipv6 mld querier
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld querier interval

`ipv6 mld querier [interval <interval-value>]`

Description

This command configures MLD querier interval. The default interval-value is 125.

Parameter	Description
`interval-value`	Required: 5-300, configures MLD querier interval. **NOTE:** Default interval-value is 125. Use the **no ipv6 mld querier interval** command to set interval-value to the default.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld querier interval 100
switch(config-if-vlan)# no ipv6 mld querier interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld querier-wait-time

```
ipv6 mld querier-wait-time <QUERIER-WAIT-TIME>
[no] ipv6 mld querier-wait-time <QUERIER-WAIT-TIME>
```

Description

Configures initial MLD querier-wait-time value in seconds.

The **no** form of this command sets the MLD querier-wait-time to the default value of 260 seconds. Note that the wait timer can be configured to any numbers within the 1-300 second range.

Parameter	Description
<QUERIER-WAIT-TIME-VALUE>	Configures MLD querier-wait-time to desired value.

Example

```
6200-1(config-if-vlan)# ipv6 mld querier-wait-time
<1-300>  Querier Wait value (Default: 260)
6200-1(config-if-vlan)#
```

When PIMv6 is enabled, automated election will override querier-wait-time configuration. When PIM is disabled and **[no] igmp querier-wait-time** is configured, the initial wait timer will be configured at desired value.

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld last-member-query-interval

```
ipv6 mld last-member-query-interval <interval-value>
```

Description

This command configures MLD last member query interval value in seconds. The default interval-value is 1 second.

Parameter	Description
`interval-value`	Required: 1-2, configures MLD last-member-query-interval.

Default interval-value is 1 second. Use the `no ipv6 mld last-member-query-interval` command to set interval-value to the default.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld last-member-query-interval 2
switch(config-if-vlan)# no ipv6 mld last-member-query-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld querier query-max-response-time

`ipv6 mld querier query-max-response-time <response-time>`

Description

This command configures MLD max response time value in seconds. The default max-response-time-value is 10 seconds.

Parameter	Description
`max-response-time-value`	Required: 10-128, configures MLD querier max-response-time. **NOTE:** Default max-response-time-value is 10 seconds. Use the **no ipv6 mld querier query-max-response-time** command to set max-response-time-value to the default.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld query-max-response-time 50
switch(config-if-vlan)# no ipv6 mld query-max-response-time
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld robustness

`ipv6 mld robustness <VALUE>`

Description

This command configures MLD robustness. The robustness value represents the number of times the querier retries queries on the connected subnets. The default robustness-value is 2 seconds.

Parameter	Description
<VALUE>	Required: 1-7, configures MLD robustness. **NOTE:** Default robustness-value is 2 seconds. Use the **no ipv6 mld robustness** command to set robustness-value to the default.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld robustness 5
switch(config-if-vlan)# no ipv6 mld robustness
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld static-group

```
ipv6 mld static-group <MULTICAST-GROUP-IP>
```

Description

This command configures MLD static group.

Parameter	Description
<MULTICAST-GROUP-IP>	Required: X:X::X:X, configures MLD static group.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld static-group ff12::c
switch(config-if-vlan)# no ipv6 mld static-group ff12::c
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld version

```
ipv6 mld version <VERSION>
no ipv6 mld version <VERSION>
```

Description

This command configures MLD version.

The **no** form of the command configures the default MLD version of **2**.

Parameter	Description
<VERSION>	Required: 1-2, configures MLD version.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld version 2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 mld version strict

```
ipv6 mld version <VERSION> [strict]
```

Description

This command configures MLD strict version. Packets that do not match the configured version will be dropped. By default, strict option is not enabled.

Parameter	Description
<VERSION>	Required: 1-2, configures MLD version.

Example

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld version 2 strict
switch(config-if-vlan)# no ipv6 mld version 2 strict
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

Chapter 82

MLD show commands for interface VLAN

show ipv6 mld

```
show ipv6 mld
   all-vrfs
   counters
   group <x:x::x:x> [source x:x::x:x]
   groups
   interface {<INTF-ID>|<INTF-ID.ID>}|{vlan <vlan-id}}
   static-groups
   statistics [all-vrfs|{vrf <vrf-name>}]
   vrf <vrf-name}
```

Description

This command shows MLD groups joined details.

Parameter	Description
`all-vrfs`	Show MLD snooping info for all VRFs in all interfaces or groups, or for all VRFs in a specified group, interface or VLAN
`counters`	Show all MLD counters, or display counters for the specified interface or VLAN
`group <x:x::x:x> [source <x:x::x:x>]`	Show MLD group information for the specified group, group and interface, or group and vlan. Include the optional **source <x:x::x:x>** parameter to dislay source information for the group.
`groups`	Show MLD group information for all VRFs, or for groups in the specified interface or VLAN.
`interface`	Shows MLD configuration information for a specified interface , sub interface, or VLAN.
`<INTF-ID>`	Specify an Interface ID
`<INTF-ID.ID>`	Specify a sub-interface ID. (Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.)
`vlan <vlan-id>`	Specify a VLAN ID
`static-groups`	Display all static groups information, or include one of the additional parameters apply additional filters: ▪ **all-vrfs**: Display MLD static-group information for all VRFs ▪ **vrf <vrf-name>**: Display MLD static-group information for the selected VRF

Parameter	Description
`statistics`	Display all MLD statistics, or include one of the additional parameters apply additional filters: ■ **all-vrfs**: Display MLD statistics information for all VRFs ■ **vrf <vrf-name>**: Display MLD statistics information forthe selcted VRF
`vrf <vrf-name>`	Show MLD information for the specified VRF.

Examples

Showing the current MLD configuration and status

```
switch# show ipv6 mld

VRF Name                   : default
Interface                  : vlan10
MLD Configured Version     : 2
MLD Operating Version      : 2
Querier State              : Querier
Querier IP [this switch]   : fe80::7272:cfff:fe96:d3ec
Querier Uptime             : 39m 44s
Querier Expiration Time    : 0m 31s
MLD Snoop Enabled on VLAN  : True
```

Showing the MLD configuration on a specified VLAN or interface:

```
switch# show ipv6 mld interface vlan 10

MLD Configured Version   : 2
MLD Operating Version    : 2
Querier State              : Querier
Querier IP [this switch]   : fe80::7272:cfff:fe96:d3ec
Querier Uptime             : 40m 42s
Querier Expiration Time    : 1m 39s
MLD Snoop Enabled on VLAN  : True

switch# show ipv6 mld interface 1/1/2

MLD Configured Version   : 2
MLD Operating Version    : 2
Querier State              : Querier
Querier IP [this switch]   : fe80::7272:cfff:fe96:d3ec
Querier Uptime             : 40m 42s
Querier Expiration Time    : 1m 39s
MLD Snoop Enabled on VLAN  : True
```

Showing MLD configuration on sub-interface 1/1/2.10:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch# show ipv6 mld interface 1/1/2.10

MLD Configured Version   : 2
MLD Operating Version    : 2
Querier State              : Querier
Querier IP [this switch]   : fe80::7272:cfff:fe96:13ec
Querier Uptime             : 40m 42s
Querier Expiration Time    : 1m 39s
MLD Snoop Enabled on VLAN  : True
```

Showing MLD groups information for a specified interface:

```
switch# show ipv6 mld interface 1/1/1 groups

MLD group information for group ff55::1

Interface Name   : 1/1/1
VRF Name         : default

Group Address    : ff55::1
Last Reporter    : fe80::a00:9ff:fe77:1062

                              V1        Sources   Sources
Vers Mode Uptime    Expires   Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------
2    EXC  0m 14s    4m 6s
```

Showing MLD groups information for a specified sub-interface:

```
switch# show ipv6 mld interface 1/1/1.10 groups

MLD group information for group ff56::1

Interface Name   : 1/1/1.10
VRF Name         : default

Group Address    : ff56::1
Last Reporter    : fe80::a00:9ff:fe77:1062

                              V1        Sources   Sources
Vers Mode Uptime    Expires   Timer     Forwarded Blocked
---- ---- --------- --------- --------- --------- --------
2    EXC  1m 14s    2m 6s
```

Showing MLD static groups

```
switch# show ipv6 mld static-groups all-vrfs

MLD Static Group Address Information

VRF Name   :default
Interface Name   Group Address
--------------- -----------------------------------------
vlan2           ff12::c
vlan2           ff12::d
VRF Name   :test
Interface Name   Group Address
--------------- -----------------------------------------
vlan3           ff13::1
vlan3           ff13::2
```

Showing MLD counters

```
switch# show ipv6 mld counters

MLD Counters

Interface Name      : vlan2
VRF Name            : default
Membership Timeout  : 0
                                             Rx            Tx
                                             ------------- -------------
V1 All Hosts Queries                         0             0
V2 All Hosts Queries                         0             12
V1 Group Specific Queries                    0             0
V2 Group Specific Queries                    0             0
Group And Source Specific Queries            0             0
V2 Member Reports                            0             N/A
V1 Member Reports                            0             N/A
V1 Member Leaves                             0             N/A
Packets dropped by ACL                       0             N/A

switch# show ipv6 mld counters vrf default

MLD Counters

Interface Name      : vlan2
VRF Name            : default
Membership Timeout  : 0
                                             Rx            Tx
                                             ------------- -------------
V1 All Hosts Queries                         0             0
V2 All Hosts Queries                         0             12
V1 Group Specific Queries                    0             0
V2 Group Specific Queries                    0             0
Group And Source Specific Queries            0             0
V2 Member Reports                            0             N/A
V1 Member Reports                            0             N/A
V1 Member Leaves                             0             N/A
Packets dropped by ACL
```

Showing MLD statistics on a specified interface:

```
switch# show ipv6 mld interface 1/1/1 statistics

MLD statistics

Interface Name : 1/1/1
VRF Name       : default

Number of Include Groups       :   2
Number of Exclude Groups       :   0
Number of Static Groups        :   0
Total Multicast Groups Joined  :   2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 83

MLD configuration commands for interface

ipv6 mld

```
ipv6 mld {enable | disable}
no ipv6 mld {enable | disable}
```

Description

This command enables or disables MLD on the interface.

The **no** form of this command disables MLD on the interface.

Parameter	Description
`enable`	Required: Enable MLD on the interface.
`disable`	Required: Disable MLD on the interface.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld enable
switch(config-if)# ipv6 mld disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld apply access-list

```
ipv6 mld apply access-list <ACL-NAME>
no ipv6 mld apply access-list <ACL-NAME>
```

Description

Configures the ACL on a particular interface to filter the MLD join or leave packets based on rules set in the particular ACL name.

The **no** form of this command removes the rules set for the ACL.

Parameter	Description
`access-list`	Associates an ACL with the IGMP.
`<ACL-NAME>`	Specifies the name of the ACL.

Usage

- Existing classifier commands are used to configure the ACL.
- In case an IGMPv3 packet with multiple group addresses is received, the switch only processes the permitted group addresses based on the ACL rule set. The packet is forwarded to querier and PIM router even though one of the groups present in the packet is blocked by ACL. This avoids the delay in learning of the permitted groups. Since the access switch configured with ACL blocks the traffic for the groups which are denied, forwarding of joins has no impact. If all the groups in the packet are denied by the ACL rule, the packet is not forwarded to the querier and PIM router. Existing joins will timeout.
- In case of IGMPv2, if there is no match or if there is a deny rule match, the packet is dropped.

Examples

On the 6400 Switch Series, interface identification differs.

Configuring the ACL to filter MLD packets based on permit/deny rules set in access list **mygroup**:

```
switch(config)# access-list ipv6 mygroup
switch(config-acl-ip)# 10 deny icmpv6 any ff55::2
switch(config-acl-ip)# 20 deny icmpv6 any ff55::3
switch(config-acl-ip)# 30 permit icmpv6 any ff55::1
switch(config-acl-ip)# exit
switch(config)# interface 1/1/1
switch(config-vlan)# ipv6 mld apply access-list mygroup
```

Configuring the ACL to remove the rules set in access list **mygroup**:

```
switch(config-vlan)# no ipv6 mld apply access-list mygroup
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-vlan`	Administrators or local user group members with execution rights for this command.

no ipv6 mld

`no ipv6 mld`

Description

This command removes all MLD configurations on the interface.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# no ipv6 mld
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld querier

`ipv6 mld querier`

Description

This command configures MLD querier. This functionality will allow the interface to join in the querier-election process.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld querier
switch(config-if)# no ipv6 mld querier
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld querier interval

`ipv6 mld querier [interval <interval-value>]`

Description

This command configures MLD querier interval. The default interval-value is 125.

Parameter	Description
`interval-value`	Required: 5-300, configures MLD querier interval. **NOTE:** Default interval-value is 125. Use the `no ipv6 mld querier interval` command to set interval-value to the default.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld querier interval 100
switch(config-if)# no ipv6 mld querier interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld last-member-query-interval

`ipv6 mld last-member-query-interval <`*`interval-value`*`>`

Description

This command configures MLD last member query interval value in seconds. The default interval-value is 1 second.

Parameter	Description
`interval-value`	Required: 1-2, configures MLD last-member-query-interval.

Default interval-value is 1 second. Use the `no ipv6 mld last-member-query-interval` command to set interval-value to the default.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld last-member-query-interval 2
switch(config-if)# no ipv6 mld last-member-query-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld querier query-max-response-time

`ipv6 mld querier query-max-response-time <`*`response-time`*`>`

Description

This command configures MLD max response time value in seconds. The default max-response-time-value is 10 seconds.

Parameter	Description
`max-response-time-value`	Required: 10-128, configures MLD querier max-response-time. **NOTE:** Default max-response-time-value is 10 seconds. Use the **no ipv6 mld querier query-max-response-time** command to set max-response-time-value to the default.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld query-max-response-time 50
switch(config-if)# no ipv6 mld query-max-response-time
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld robustness

`ipv6 mld robustness <value>`

Description

This command configures MLD robustness. The robustness value represents the number of times the querier retries queries on the connected subnets. The default robustness-value is 2 seconds.

Parameter	Description
`robustness-value`	Required: 1-7, configures MLD robustness.

Default robustness-value is 2 seconds. Use the `no ipv6 mld robustness` command to set robustness-value to the default.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/11/1
switch(config-if)# ipv6 mld robustness 5
switch(config-if)# no ipv6 mld robustness
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld static-group

`ipv6 mld static-group <multicast-group-ip>`

Description

This command configures MLD static group.

Parameter	Description
`multicast-group-ip`	Required: X:X::X:X, configures MLD static group.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld static-group ff12::c
switch(config-if)# no ipv6 mld static-group ff12::c
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld version

```
ipv6 mld version <version>
no ipv6 mld version <version>
```

Description

This command configures MLD version.

The **no** form of this command removes MLD version from the interface.

Parameter	Description
`version`	Required: 1-2, configures MLD version.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld version 2
```

```
switch(config)# interface 1/1/1
switch(config-if)# no ipv6 mld version 2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

ipv6 mld version strict

```
ipv6 mld version <version> [strict]
```

Description

This command configures MLD strict version. Packets that do not match the configured version will be dropped. By default, strict option is not enabled.

Parameter	Description
`version`	Required: 1-2, configures MLD version.

Example

On the 6400 Switch Series, interface identification differs.

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 mld version 2 strict
switch(config-if)# no ipv6 mld version 2 strict
```

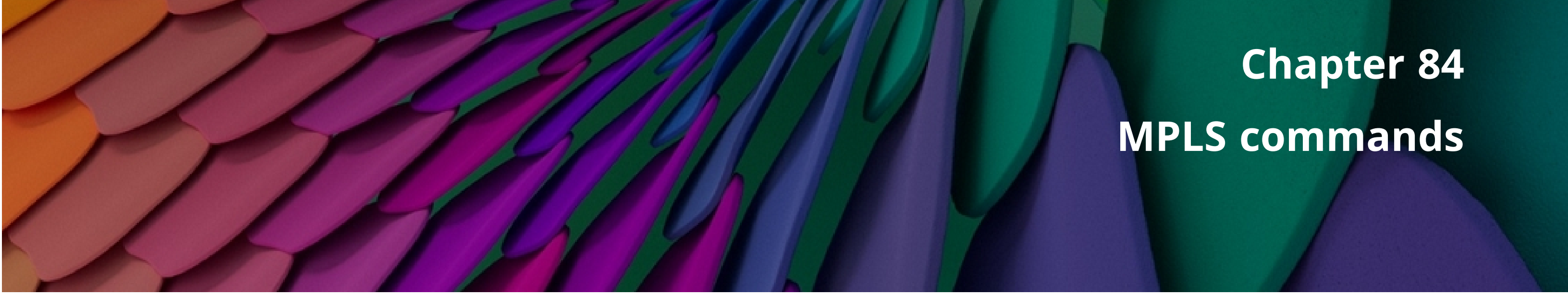
For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.



Chapter 84

MPLS commands

bind ipv4 (lsp label imposition)

```
bind ipv4 {<IP-ADDR>/<MASK> | <IP-ADDR> <MASK>} output <IFNAME> <IP-ADDR> <OUT-LABEL>
no bind ipv4 {<IP-ADDR>/<MASK> | <IP-ADDR><MASK>} output <IFNAME><IP-ADDR><OUT-LABEL>
```

Description

Performs LSP label imposition by adding label to an ingress packet (push operation).

The **no** form of this command removes the ingress packet label.

Parameter	Description
`ipv4 <IP-ADDR>/<MASK>`	Specifies the IPv4 destination in x.x.x.x format, where x is a decimal value from 0 to 255 and the number of bits in an IPv4 address mask in CIDR format (x), where x is a decimal number from 0 to 32.
`ipv4 <IP-ADDR> <MASK>`	Specifies the IPv4 destination in x.x.x.x format, where x is a decimal value from 0 to 255 and the destination IP subnet mask in x.x.x.x format, where x is a decimal value from 0 to 255.
`<IFNAME>`	Specifies the egress interface of the binding.
`<IP-ADDR>`	Specifies he next hop IP address of the binding.
`<OUT-LABEL>`	Specifies the MPLS label to apply. Range: 16-1048575.

Usage

- The **no** form of both the **mpls** and **static-lsp** commands deletes all static LSP bindings.
- The static LSP label range must be allocated before configuring static LSP bindings.
- Specifying an outgoing label outside the range of 16-1048575 is not allowed. An outgoing label is not bound by allocated static LSP label range.
- Types of valid egress interfaces are: System, LAG, VLAN, and Tunnel.
  - Routing must be enabled for egress interfaces.
  - Interfaces must be configured before performing the bind command.
  - LAG member interfaces are not allowed as egress interfaces.

Examples

Configuring binding:

```
switch(config-mpls-static-lsp)# bind ipv4 2.2.2.0/24 output 1/1/1 20.0.0.2 20
```

Unconfiguring binding:

```
switch(config-mpls-static-lsp)# no bind ipv4 2.2.2.0/24 output 1/1/1 20.0.0.2 20
```

Configuring binding with an invalid egress interface:

```
switch(config-mpls-static-lsp)# bind ipv4 2.2.2.0/24 output 1/1/1 20.0.0.2 20
 The output must be a layer 3 interface with routing enabled.
```

Configuring binding with an interface that does not have an IP address assigned:

```
switch(config-mpls-static-lsp)# bind ipv4 2.2.2.0/24 output 1/1/1 20.0.0.2 20
 The egress interface must have an IP address assigned.
```

Configuring binding with a next hop IP that is not in the same subnet as egress interface:

```
switch(config-if)# interface 1/1/1
switch(config-if)# no shutdown
switch(config-if)# ip address 10.0.0.1/24
switch(config-if)# mpls enable
switch(config-if)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# bind ipv4 2.2.2.0/24 output 1/1/1 60.0.0.20 40
 The next hop IP address must be in the same subnet as interface 1/1/1.
```

Configuring binding with a next hop IP that is the same as the egress interface IP:

```
switch(config-if)# int 1/1/1
switch(config-if)# no shutdown
switch(config-if)# ip address 10.0.0.1/24
switch(config-if)# mpls enable
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# bind ipv4 2.2.2.0/24 output 1/1/1 10.0.0.1  40
 The next hop IP address cannot be the same as any interface 1/1/1 primary or
secondary addresses.
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls-static-lsp`	Administrators or local user group members with execution rights for this command.

bind ipv4 input (static lsp binding)

```
bind ipv4 input <in-label>
no bind ipv4 input <in-label>
```

Description

Performs label disposition by removing label from an egress packet (pop operation).

The **no** form of this command removes the static LSP binding configuration.

Parameter	Description
<in-label>	Specifies the MPLS label to bind. Range: 16-1048575.

Usage

- The **no** form of both the **mpls** and **static-lsp** commands deletes all MPLS binding configurations.
- The static LSP label range must be allocated before configuring static LSP bindings.
- Specifying an incoming label outside the range of 16-1048575 is not allowed. An incoming label is bound by the allocated static LSP label range.

Examples

Configuring static LSP binding for label disposition:

```
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# bind ipv4 input 20
```

Removing the configuration for static LSP binding:

```
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# no bind ipv4 input 20
```

Configuring static LSP binding outside the label range:

```
switch(config-mpls-static-lsp)# bind ipv4 input 200
The input label must be within the range specified by label-range.
```

Configuring static LSP binding without first allocating a label range:

```
switch(config-mpls-static-lsp)# bind ipv4 input 20
A label range must be allocated before configuring bindings.
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-aruba-central`	Administrators or local user group members with execution rights for this command.

clear mpls statistics

```
clear mpls statistics {ingress | egress} <LABEL>
no syntax
```

Description

Clears MPLS statistics per label for all sessions.

Parameter	Description
`ingress`	Selects ingress statistics.
egress	Selects egress statistics.
`<LABEL>`	Specifies the label for which statistics will be cleared.

Examples

Clearing ingress MPLS statistics for a specific label:

```
switch# clear mpls statistics ingress 20
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

crossconnect input (static lsp binding label swap)

```
crossconnect input <in-label> output <IFNAME> <ID-ADDR> {<out-label> | explicit-null}
no crossconnect input <in-label> output <IFNAME> <ID-ADDR> {<out-label> | explicit-null}
```

Description

Configures a static LSP binding to swap labels and route to the given next hop.

The **no** form of this command removes the static LSP binding label swap configuration.

Parameter	Description
<in-label>	Specifies the MPLS label to bind. Range: 16-1048575.
<IFNAME>	Specifies the egress interface of the binding.
<IP-ADDR>	Specifies the next hop IP address of the binding.
<out-label>	Specifies the MPLS label to apply. Range: 16-1048575.
`explicit-null`	Specifies an IETF MPLS IPv4 explicit null label (0).

Usage

- A static LSP label range must be allocated before configuring static LSP bindings.
- An incoming label must be within the allocated static LSP label range. Outgoing labels are not bound by the allocated static LSP label range, but must still be within the range of 16-1048575.
- The types of valid outgoing interfaces are: System, LAG, VLAN, and Tunnel.
  - Routing must be enabled for egress interfaces.
  - LAG member interfaces cannot be used with this command.
- Next hop and outgoing label pairs must be unique for each crossconnect binding.

Examples

Configuring crossconnect with an incoming and outgoing label:

```
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# crossconnect input 20 output 1/1/2 11.0.3.2 21
```

Configuring explicit-null PHP:

```
switch(config-mpls-static-lsp)# crossconnect input 20 output 1/1/2 11.0.3.2
explicit-null
```

Removing crossconnect binding:

```
switch(config-mpls-static-lsp)# no crossconnect input 20 output 1/1/2 11.0.3.2 21
```

Configuring crossconnect with an incoming label outside the allocated range:

```
switch(config-mpls-static-lsp)# crossconnect input 20 output 11.0.3.2 99
 Failed to configure static LSP binding. Incoming label not in range allocated for
static LSP.
```

Configuring crossconnect with an interface that does not have routing enabled:

```
switch(config-mpls-static-lsp)# crossconnect input 20 output 1/1/8 11.0.3.2 21
The egress interface must have an IP address assigned.
```

Configuring crossconnect with a nexthop IP that is not in the same subnet as egress interface:

```
switch(config-if)# int 1/1/1
switch(config-if)# no shutdown
switch(config-if)# ip address 10.0.0.1/24
switch(config-if)# mpls enable
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# crossconnect input 35 output 1/1/1 60.0.0.20 40
The next hop IP address must be in the same subnet as interface 1/1/1.
```

Configuring crossconnect with a nexthop IP that is the same as the egress interface IP:

```
switch(config-if)# int 1/1/1
switch(config-if)# no shutdown
switch(config-if)# ip address 10.0.0.1/24
switch(config-if)# mpls enable
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# crossconnect input 35 output 1/1/1 10.0.0.1  40
The next hop IP address cannot be the same as any interface 1/1/1 primary or
secondary addresses.
```

Configuring crossconect with a nexthop IP and outgoing label of an already existing binding:

```
switch(config-if)# int 1/1/1
switch(config-if)# no shutdown
switch(config-if)# ip address 10.0.0.1/24
switch(config-if)# mpls enable
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# crossconnect input 35 output 1/1/1 10.0.0.2 40
switch(config-mpls-static-lsp)# crossconnect input 36 output 1/1/1 10.0.0.2 40
 A static LSP binding with the same nexthop and outgoing label already exists.
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls-static-lsp`	Administrators or local user group members with execution rights for this command.

enable (mpls globally)

```
enable
no enable
```

Description

Enables MPLS forwarding of IPv4 traffic globally.

The **no** form of this command disables MPLS forwarding of IPv4 traffic globally.

Examples

Enabling MPLS forwarding of IPv4 traffic:

```
switch(config)# mpls
switch(config-mpls)# enable
```

Disabling MPLS forwarding of IPv4 traffic:

```
switch(config)# mpls
switch(config-mpls)# no enable
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls`	Administrators or local user group members with execution rights for this command.

enable mpls (interface)

```
mpls enable
no mpls enable
```

Description

Enables MPLS forwarding of IP traffic for the interface.

The **no** form of this command disables MPLS forwarding of IP traffic for the interface.

Usage

- Routing must be configured before enabling MPLS on an interface.

Examples

Enabling MPLS forwarding:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# mpls enable
```

Enabling MPLS on a layer 2 interface:

```
switch(config)# interface 1/1/2
switch(config-if)# mpls enable
Routing must be enabled on this interface to use MPLS
```

Disabling MPLS forwarding:

```
switch(config)# interface 1/1/2
switch(config-if)# no mpls enable
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if`	Administrators or local user group members with execution rights for this command.

enable (mpls ldp)

```
enable
no enable
```

Description

Enables MPLS LDP.

The **no** form of this command disable MPLS LDP.

Usage

- The LDP back off timer cannot be configured. It is set to exponentially back off session retry attempts with initial value of 15 seconds and a maximum of 2 minutes.

Examples

Enabling MPLS LDP:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# enable
```

Disabling MPLS LDP:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no enable
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls-ldp`	Administrators or local user group members with execution rights for this command.

enable (mpls static lsp)

```
enable
no enable
```

Description

Enables MPLS static LSPs.

The **no** form of this command disables static LSPs.

Usage

A static LSP binding will be processed when MPLS is globally enabled, static LSP is enabled, and the ingress and egress interface has MPLS enabled.

Examples

Enabling MPLS static LSPs:

```
switch(config)# mpls
switch(config-mpls)# enable
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# enable
```

Disabling static LSPs:

```
switch(config)# mpls
switch(config-mpls)# static-lsp
switch(config-mpls-static-lsp)# no enable
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6400	`config`
	`config-mpls`
	`config-mpls-static-lsp`
		Administrators or local user group members with execution rights for this command.

graceful-restart (mpls ldp)

```
graceful-restart
```

Description

Enables LDP graceful restart. Graceful restart is enabled by default. With graceful restart enabled, the MPLS forwarding state will be temporarily retained if the control plane restarts. The switch will wait after losing LDP neighbors before deleting bindings from that neighbor. See graceful-restart-timers (mpls ldp) for details. Graceful restart is enabled for LDP sessions only when the LDP setting and the overall router setting are enabled. If either is disabled, then graceful restart will not occur for LDP sessions.

Upon being disabled or enabled, any LDP sessions will be restarted, which may result in temporary traffic loss.

The **no** form of this command disables LDP graceful restart

Examples

Enabling MPLS LDP graceful restart:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# graceful-restart
Enabling graceful restart will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

Disabling MPLS LDP graceful restart:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no graceful-restart
Enabling graceful restart will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6400	`config-mpls-ldp`	Administrators or local user group members with execution rights for this command.

graceful-restart-timers (mpls ldp)

```
graceful-restart-timers {forwarding-holding <SECONDS> | max-recovery <SECONDS> |
neighbor-liveness <SECONDS>}
no graceful-restart-timers {forwarding-holding <SECONDS> | max-recovery <SECONDS> |
neighbor-liveness <SECONDS>}
```

Description

Configures MPLS LDP discovery hold time for peers found via hello packets.

The **no** form of this command resets the discovery hello hold time to its default value of 15 seconds.

The BGP restart timer must be configured as 180 seconds or higher for graceful restart to work with MPLS.

It is recommended to configure the OSPF graceful restart timer as lower than the LDP forward-holding timer, which in turn should be configured as lower than the BGP graceful restart timer.

Parameter	Description
`forwarding-holding <SECONDS>`	Specifies the amount of time in seconds that the MPLS forwarding state should be preserved after the control plane restarts. Range: 30-600. Default: 150.
`max-recovery <SECONDS>`	Specifies the amount of time in seconds that the stale label bindings should be kept on the router after the LDP session has been reestablished. Range: 15-600. Default: 120.
`neighbor-liveness <SECONDS>`	Specifies the amount of time in seconds that the router will wait for the LDP session to be reestablished. If the router cannot reestablish the LDP session within that time, the router deletes all the stale LDP bindings received from that LDP neighbor. Range: 5-300. Default: 120.

Examples

Configuring the MPLS LDP graceful restart forwarding holding time for 30 seconds:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# graceful-restart-timers forwarding-holding 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.
Continue (y/n)? y
```

Resetting the MPLS LDP graceful restart forwarding holding time to default:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no graceful-restart-timers forwarding-holding
switch(config-mpls-ldp)# no graceful-restart-timers forwarding-holding 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.
Continue (y/n)? y
```

Configuring the MPLS LDP graceful restart max recovery time for 30 seconds:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# graceful-restart-timers max-recovery 30
Changing the timer value will restart any LDP sessions.
```

```
This may result in traffic loss.

Continue (y/n)? y
```

Resetting the MPLS LDP graceful restart max recovery time to default:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no graceful-restart-timers max-recovery
switch(config-mpls-ldp)# no graceful-restart-timers max-recovery 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

Configuring the MPLS LDP graceful restart neighbor liveness timefor 30 seconds:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# graceful-restart-timers neighbor-liveness 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

Resetting the MPLS LDP graceful restart neighbor liveness to default:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no graceful-restart-timers neighbor-liveness
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6400	`config-mpls-ldp`	Administrators or local user group members with execution rights for this command.

label-protocol ldp

```
label-protocol ldp
no label-protocol ldp
```

Description

Configures the Label Distribution Protocol (LDP).

The **no** form of this command removes all LDP-related configuration.

Examples

Configuring LDP:

```
switch(config-mpls)# label-protocol ldp
```

Removing all LDP-related configuration:

```
switch(config-mpls)# no label-protocol ldp
All MPLS LDP configuration will be deleted.

Continue (y/n)? y
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls`	Administrators or local user group members with execution rights for this command.

label-range (static lsp)

```
label-range <start-label-range> <end-label-range>
no label-range <start-label-range> <end-label-range>
```

Description

Allocates MPLS labels for use exclusively by static LSP.

The **no** form of this command removes the configured allocation, returning to the default state with no labels allocated for static LSP usage.

Parameter	Description
<start-label-range>	Selects the start of the static LSP label range. Range: 16-1048575.
<end-label-range>	Selects the end of the static LSP label range. Range: 16-1048575.

Usage

- The range arguments are inclusive. Configuring a range of 20-30 will allocate the labels 20, 21, ..., 29, 30.
- Static LSP labels must not overlap with labels used by any other protocol, i.e. LDP. This label range allocation command will fail if any labels are shared between protocols.
- Any change to the static LSP label allocation will fail if any static LSP bindings are configured. All bindings must be removed before the static LSP label range can be reallocated.
- Allocated label range affects only the ingress packets. Labels for the outgoing packets must be within the allocated label range of the next hop device.

Examples

Allocating a valid static LSP label range:

```
switch(config-mpls-static-lsp)# label-range 100 2000
```

Changing the static LSP label range while LSP bindings are configured:

```
switch(config-mpls-static-lsp)# label-range 100 2000
All static LSP bindings must first be deleted.
```

Deallocating static LSP label range; use either command:

```
switch(config-mpls-static-lsp)# no label-range 100 2000
switch(config-mpls-static-lsp)# no label-range
```

Configuring a static LSP range that intersects with LDP:

```
switch(config-mpls-static-lsp)# label-range 30 99
 The static LSP label range cannot overlap with any other MPLS range.
```

Deallocating static LSP range when bindings are still configured:

```
switch(config-mpls-static-lsp)# no label-range
 All static LSP bindings must be removed before removing the label range.
 All static LSP bindings must be removed before removing the label range.
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls-static-lsp`	Administrators or local user group members with execution rights for this command.

mpls

```
mpls
no mpls
```

Description

Configures MPLS forwarding of IPv4 traffic globally.

The **no** form of the command removes all MPLS-related configuration.

Examples

Configuring MPLS forwarding for IPv4 traffic:

```
switch(config)# mpls
```

Removing MPLS configuration for IPv4 traffic:

```
switch(config)# no mpls
All MPLS configuration will be deleted.

Continue (y/n)? y
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config`	Administrators or local user group members with execution rights for this command.

mpls ldp discovery hello hold time (global)

```
discovery hello holdtime <SECONDS>
no discovery hello holdtime <SECONDS>
```

Description

Configures MPLS LDP discovery hold time for peers found via hello packets.

The **no** form of this command resets the discovery hello hold time to its default value of 15 seconds.

Parameter	Description
<SECONDS>	Specifies the discovery hold time in seconds. Range: 15-65535. Default: 15.

Usage

- The default value of discovery hello hold time is 15 seconds
- The discovery hello hold time configured on an interface supersedes the global configuration.
- The discovery hello interval time is auto-computed as one third of the hello hold time.

Examples

Configuring the MPLS LDP discovery hello hold time:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# discovery hello holdtime 30
```

Changing discovery hello hold time:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# discovery hello holdtime 50
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls-ldp`	Administrators or local user group members with execution rights for this command.

mpls ldp discovery hello hold time (interface)

```
mpls ldp discovery hello holdtime <SECONDS>
no mpls ldp discovery hello holdtime <SECONDS>
```

Description

Overrides the global MPLS LDP discovery hold time for peers found via hello packets from the given interface.

The **no** form of this command resets the discovery hello hold time for the given interface to the global value (if configured) or default value of 15 seconds if global value is not specified.

Parameter	Description
<SECONDS>	Specifies the discover hello hold time on an interface. Range: 15-65535. Default: 15.

Usage

- The interface LDP discovery hello hold time overrides global hello hold time.
- Routing must be configured before changing the LDP discovery hold time on an interface.

Examples

Configuring the interface MPLS LDP discovery hello hold time:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# mpls ldp discovery hello holdtime 30
```

Removing the interface MPLS LDP discovery hello hold time configuration:

```
switch(config)# interface 1/1/1
switch(config-if)# no mpls ldp discovery hello holdtime
```

Configuring the interface MPLS LDP discovery hello hold time on a Layer 2 interface:

```
switch(config)# interface 1/1/2
switch(config-if)# mpls ldp discovery hello holdtime 30
Routing must be enabled on this interface to use MPLS.
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if`	Administrators or local user group members with execution rights for this command.

mpls ldp enable

```
mpls ldp enable
no mpls ldp enable
```

Description

Enables LDP protocol in the interface level.

The **no** form of this command disables LDP.

Enabling/disabling interface level LDP will also enable/disable **php-mode-explicit-null** by default. **php-mode-explicit-null** is currently the only mode supported and there is no option to disable it when LDP is enabled on an interface.

Usage

- Routing must be configured before enabling LDP on an interface.
- MPLS must be enabled on the interface prior to enabling LDP.

Examples

Enabling the LDP protocol:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# mpls enable
switch(config-if)# mpls ldp enable
```

Enabling LDP prior to enabling MPLS:

```
switch(config)# interface 1/1/2
switch(config-if)# routing
switch(config-if)# mpls ldp enable
MPLS must be enabled on this interface to use LDP.
```

Enabling MPLS on a layer 2 interface:

```
switch(config)# interface 1/1/2
switch(config-if)# mpls ldp enable
```

```
Routing must be enabled on this interface to use MPLS.
```

Disabling MPLS forwarding:

```
switch(config)# interface 1/1/2
switch(config-if)# no mpls ldp enable
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if`	Administrators or local user group members with execution rights for this command.

graceful-restart-timers (mpls ldp)

```
graceful-restart-timers {forwarding-holding <SECONDS> | max-recovery <SECONDS> |
neighbor-liveness <SECONDS>}
no graceful-restart-timers {forwarding-holding <SECONDS> | max-recovery <SECONDS> |
neighbor-liveness <SECONDS>}
```

Description

Configures MPLS LDP discovery hold time for peers found via hello packets.

The **no** form of this command resets the discovery hello hold time to its default value of 15 seconds.

The BGP restart timer must be configured as 180 seconds or higher for graceful restart to work with MPLS.

It is recommended to configure the OSPF graceful restart timer as lower than the LDP forward-holding timer, which in turn should be configured as lower than the BGP graceful restart timer.

Parameter	Description
`forwarding-holding <SECONDS>`	Specifies the amount of time in seconds that the MPLS forwarding state should be preserved after the control plane restarts. Range: 30-600. Default: 150.

Parameter	Description
`max-recovery <SECONDS>`	Specifies the amount of time in seconds that the stale label bindings should be kept on the router after the LDP session has been reestablished. Range: 15-600. Default: 120.
`neighbor-liveness <SECONDS>`	Specifies the amount of time in seconds that the router will wait for the LDP session to be reestablished. If the router cannot reestablish the LDP session within that time, the router deletes all the stale LDP bindings received from that LDP neighbor. Range: 5-300. Default: 120.

Examples

Configuring the MPLS LDP graceful restart forwarding holding time for 30 seconds:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# graceful-restart-timers forwarding-holding 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.
Continue (y/n)? y
```

Resetting the MPLS LDP graceful restart forwarding holding time to default:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no graceful-restart-timers forwarding-holding
switch(config-mpls-ldp)# no graceful-restart-timers forwarding-holding 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.
Continue (y/n)? y
```

Configuring the MPLS LDP graceful restart max recovery time for 30 seconds:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# graceful-restart-timers max-recovery 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

Resetting the MPLS LDP graceful restart max recovery time to default:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no graceful-restart-timers max-recovery
switch(config-mpls-ldp)# no graceful-restart-timers max-recovery 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

Configuring the MPLS LDP graceful restart neighbor liveness timefor 30 seconds:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# graceful-restart-timers neighbor-liveness 30
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

Resetting the MPLS LDP graceful restart neighbor liveness to default:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no graceful-restart-timers neighbor-liveness
Changing the timer value will restart any LDP sessions.
This may result in traffic loss.

Continue (y/n)? y
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6400	`config-mpls-ldp`	Administrators or local user group members with execution rights for this command.

mpls ldp session holdtime (interface)

```
mpls ldp session holdtime <TIME>
no mpls ldp session holdtime <TIME>
```

Description

Configures MPLS LDP session hold time for an interface.

The **no** form of this command resets the session hold time to its default value of 15 seconds.

Parameter	Description
<TIME>	Specifies the session hold time for the interface in seconds. Range: 15-65535. Default: 40.

Usage

- The interface LDP session hold time overrides global hello hold time.
- Routing must be configured before changing LDP session holdtime on an interface.

Examples

Configuring the MPLS LDP session hold time for an interface:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# mpls ldp session holdtime 30
```

Removing the MPLS LDP session hold time for the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no mpls ldp session holdtime 30
```

Configuring the MPLS LDP session hold time on a layer 2 interface:

```
switch(config)# interface 1/1/2
switch(config-if)# mpls ldp session holdtime 30
Routing must be enabled on this interface to use MPLS.
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if`	Administrators or local user group members with execution rights for this command.

ping mpls

```
ping mpls ipv4 <IP-ADDR/MASK> [source <IP-ADDR> | destination <IP-ADDR> | ttl <HOPS> |
size <BYTES> | repeat <NUMBER> | timeout <TIME> | interval <TIME>]
```

Description

Ping MPLS is a command which sends LSP ping packets on the MPLS network and displays the responses from the remote target. It is used as a debugging and analytics tool to verify connectivity within MPLS networks.

Parameter	Description
`ipv4 <IP-ADDR/MASK>`	Specifies target IP address and mask of the remote subnet to ping.
`source <IP-ADDR>`	Specifies the source IPv4 address for the request packet.
`destination <IP-ADDR>`	Specifies the destination address for the request packet. Default: 127.0.0.1.
`ttl <HOPS>`	Specifies the max number of hops a packet can take en route to its destination. Range: 1-255. Default: 64.
`size <BYTES>`	Specifies the size of the packet to be sent in bytes. Range: 0-9600. Default: 0.
`repeat <NUMBER>`	Specifies the number of packets to be sent. Range 1-10000. Default: 5.
`timeout <TIME>`	Specifies the amount of time in seconds after which a packet is considered dropped. Range 1-60. Default: 2.
`interval <TIME>`	Specifies the interval time between packets in seconds. Range: 1-60 seconds. Default: 1.

Examples

Sending 5 successful pings to the destination to the 10.10.10.10/32 subnet with a source IP address 20.20.20.1, a destination IP of 127.0.0.1, a zero byte payload, 64 hop time to live, 3 second interval between packets, and a 5 second timeout:

```
switch# ping mpls ipv4 10.10.10.10/32 source 20.20.20.1 destination 127.0.0.1
repeat 5 size 0 ttl 64 interval 3 timeout 5
Sending 5 MPLS Echo packets of size 0 bytes to 10.10.10.0/32 from source
20.20.20.1,
timeout is 5 sec, send interval is 3 sec:
Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
       'U' - unreachable, 'M' - malformed request, 'T' - unsupported TLV,
       'E' - malformed response, 'R' - transit router
Type escape sequence (Ctrl + C) to abort.
!!!!!
1908 Success rate is 100 percent (5/5), round-trip min/avg/max = 7/10/13 ms
```

Sending an unsuccessful ping that fails because the network is unreachable:

```
switch# ping mpls ipv4 10.10.10.10/32 source 20.20.20.1 destination 127.0.0.1
repeat 5 size 0
Sending 5 MPLS Echo packets of size 0 bytes to 10.10.10.0/32 from source
20.20.20.1,
timeout is 2 sec, send interval is 1 sec:
Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
       'U' - unreachable, 'M' - malformed request, 'T' - unsupported TLV,
       'E' - malformed response, 'R' - transit router
Type escape sequence (Ctrl + C) to abort.
Network unreachable
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6400	Manager (#)	Administrators or local user group members with execution rights for this command.

router-id (mpls ldp)

```
router-id <IFNAME> [confirm]
no router-id <IFNAME> [confirm]
```

Description

Configures MPLS LDP router ID which is the IP address of a loopback interface.

The **no** form of this command removes the MPLS LDP router ID configuration.

Parameter	Description
<IFNAME>	Specifies the loopback interface for the MPLS LDP router ID.

Usage

- There is a possibility of MPLS traffic disruption whenever a router ID is deleted or updated to another loopback interface.
- The MPLS router ID interface must be a loopback interface with an IPv4 address configured.
- The confirmation prompt is skipped if the router ID is being configured for the first time by the user.
- Changing the IP address of the loopback interface may interrupt MPLS traffic.

Examples

Configuring an MPLS LDP router ID:

```
switch(config)# interface loopback 1
switch(config-loopback-if)# ip address 1.1.1.1/32

switch(config)# mpls
switch(config-mpls)# enable
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# enable
switch(config-mpls-ldp)# router-id loopback1
```

Changing the MPLS LDP router ID loopback interface:

```
switch(config)# interface loopback 2
switch(config-loopback-if)# ip address 2.2.2.2/32

switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# router-id loopback2
Changing the router ID interface may disrupt MPLS traffic.

Continue (y/n)?
```

Changing the MPLS LDP router ID interface without prompting for confirmation:

```
switch(config)# interface loopback 2
switch(config-loopback-if)# ip address 2.2.2.2/24

switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# router-id loopback2 confirm
```

Removing the MPLS LDP router ID configuration:

```
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no router-id loopback2
Removing the router ID interface may disrupt MPLS traffic.

Continue (y/n)?
```

Removing the MPLS LDP router ID without providing loopback interface name:

```
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no router-id
Removing the router ID interface may disrupt MPLS traffic.

Continue (y/n)?
```

Removing the configuration of an MPLS LDP router ID with an interface name which is different than the one configured as router ID:

```
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# router-id loopback1 confirm
switch(config-mpls-ldp)# no router-id loopback2
The value to disable does not match the currently configured value.
```

Removing the MPLS LDP router ID configuration prompting for confirmation:

```
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# no router-id loopback2 confirm
```

Configuring an MPLS LDP router ID with system interface:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# enable
switch(config-mpls-ldp)# router-id 1/1/1
The router ID must be a loopback interface with an IP address assigned.
```

Configuring MPLS LDP router ID with a loopback interface without an IPv4 address configured:

```
switch(config)# interface loopback 1

switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# enable
switch(config-mpls-ldp)# router-id loopback1
The router ID interface must have an IP address assigned.
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-loopback-if` `config-mpls-ldp`	Administrators or local user group members with execution rights for this command.

session hold time (mpls ldp globally)

```
session holdtime <SECONDS>
no session holdtime <SECONDS>
```

Description

Configures MPLS LDP session hold time.

The **no** form of this command resets the session hold time to its default value of 40 seconds.

Parameter	Description
<SECONDS>	Specifies the session hold time in seconds. Range: 15-65535. Default: 40.

Usage

- The default session hold time is 40 seconds
- The session hold time configured on an interface supersedes the global configuration.
- The session keepalive interval time is auto computed as one sixth of the hold time.

Examples

Configuring the MPLS LDP session hold time:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(config-mpls-ldp)# session holdtime 30
```

Changing the session hold time:

```
switch(config)# mpls
switch(config-mpls)# label-protocol ldp
switch(switch(config-mpls-ldp)# session holdtime 50)# session holdtime 50
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls-ldp`	Administrators or local user group members with execution rights for this command.

show bgp vpnv4 unicast

```
show bgp VPNv4 unicast [[<IP-ADDR>/<MASK>] | community | extcommunity |
neighbors [<IP-ADDR>] | paths | summary | vsx-peer]
```

Description

Shows all vpnv4 entries in the BGP routing table .

Parameter	Description
<IP-ADDR>/<MASK>	Specifies the IP network and mask of a specific BGP route in IPv4 format (x.x.x.x/M), where x is a decimal number from 0 to 255 and M is the number of bits in CIDR format from 0 to 32.

Parameter	Description
`community`	Selects routes that belong to specified BGP communities.
`extcommunity`	Selects unicast routes with extended communities.
`neighbors [<IP-ADDR>]`	Selects BGP neighbor connection parameters for all neighbors or the IP address of a specific neighbor in IPv4 format (x.x.x.x) where x is a decimal number from 0 to 255.
`paths`	Selects AS Path information of the vpnv4 routes in BGP RIB.
`summary`	Selects a summary of BGP neighbor status.
`vsx-peer`	Selects VSX peer switch information.

Examples

Showing all VPNv4 entries in the BGP routing table:

```
switch# show bgp vpnv4 unicast
VRF : default
BGP Summary
-----------
 Local AS               : 100          BGP Router Identifier  : 4.4.4.4
 Peers                  : 0            Log Neighbor Changes   : No
 Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60
 Confederation Id       : 0

PE2# show bgp vpnv4 unicast
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 4.4.4.4

    Network            Nexthop         Metric     LocPrf     Weight Path

Route Distinguisher: 100:100              (Label 22)
*>i 11.1.1.0/30        1.1.1.1         0          100        0       ?

Route Distinguisher: 1.1.1.1:200          (Label 23)
*>i 11.1.2.0/30        1.1.1.1         0          100        0       ?

Route Distinguisher: 100:300              (Label 24)
*>i 11.1.3.0/30        1.1.1.1         0          100        0       ?

Route Distinguisher: 100:400              (Label 25)
*>i 11.1.4.0/30        1.1.1.1         0          100        0       ?
Total number of entries 4
```

Showing entries in the BGP routing table for the *11.1.3.0/30* network:

```
switch# show bgp vpnv4 unicast 11.1.3.0/30

VRF : default
BGP Local AS 100         BGP Router-id 4.4.4.4
```

```
   Network           : 11.1.3.0/30               Nexthop             : 1.1.1.1
   Peer              : 1.1.1.1                   Origin              : incomplete
   Metric            : 0                         Local Pref          : 100
   Weight            : 0                         Calc. Local Pref    : 100
   Best              : Yes                       Valid               : Yes
   Type              : internal                  Stale               : No
   Originator ID     : 0.0.0.0                   Path ID             : 0
   Aggregator ID     :
   Aggregator AS     :
   Atomic Aggregate  :

   AS-Path           :
   Cluster List      :
   Communities       :
   Ext-Communities   :
```

Showing entries in the BGP routing table for routes with extended communities:

```
switch# show bgp vpnv4 unicast extcommunity
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed, a additional-paths
Origin codes: i - IGP, e - EGP, ? - incomplete

VRF : default
Local Router-ID 4.4.4.4

    Network             Next Hop           Ecommunity
*>i 11.1.1.0/30         1.1.1.1            100:100

*>i 11.1.2.0/30         1.1.1.1            4.4.4.4:200

*>i 11.1.3.0/30         1.1.1.1            100:300

*>i 11.1.4.0/30         1.1.1.1            100:400

Total number of entries 4
```

Showing BGP neighbor connection parameters for all neighbors:

```
switch# show bgp vpnv4 unicast neighbors
Codes: ^ Inherited from peer-group

VRF : default

BGP Neighbor 1.1.1.1 (Internal)
    Description         : MPBGP Session to PE2
    Peer-group          :

    Remote Router Id    : 1.1.1.1            Local Router Id    : 4.4.4.4
    Remote AS           : 100                Local AS           : 100
    Remote Port         : 179                Local Port         : 38335
    State               : Established        Admin Status       : Up
    Conn. Established   : 1                  Conn. Dropped      : 0
    Passive             : No                 Update-Source      : loopback0
    Cfg. Hold Time      : 180                Cfg. Keep Alive    : 60
    Neg. Hold Time      : 180                Neg. Keep Alive    : 60
    Up/Down Time        : 00h:56m:46s        Connect-Retry Time : 120
    Local-AS Prepend    : No                 Alt. Local-AS      : 0
    BFD                 : Disabled
    Password            :
    Last Err Sent       : No Error
    Last SubErr Sent    : No Error
    Last Err Rcvd       : No Error
    Last SubErr Rcvd    : No Error

    Graceful-Restart    : Enabled           Gr. Restart Time   : 120
    Gr. Stalepath Time  : 300               Remove Private-AS  : No
    TTL                 : 255               Local Cluster-ID   :
    Weight              : 0                 Fall-over          : No
    Confederation-Peers : No

    Message statistics        Sent     Rcvd
    -------------------      -----    -----
    Open                         1        1
    Notification                 0        0
    Updates                      7        7
    Keepalives                  64       65
    Route Refresh                0        0
    Total                       72       73

    Capability                          Advertised      Received
    -----------                         -----------     ----------
    Route Refresh                       Yes             Yes
    Graceful Restart                    Yes             Yes
    Add-Path                            No              No
    Four Octet ASN                      Yes             Yes
    Address family IPv4 Unicast         No              No
    Address family IPv6 Unicast         No              No
    Address family VPNv4 Unicast        Yes             Yes
    Address family L2VPN EVPN           No              No

    Address Family : VPNv4 Unicast
    ------------------------------

    Rt. Reflect. Client : No                 Send Community    : both
    Allow-AS in         : 0                  Advt. Interval    : 30
    Max. Prefix         : 32500              Soft Reconfig In  :
    Nexthop-Self        :                    Default-Originate :
    Cfg. Add-Path       :
    Neg. Add-Path       :

    Routemap In         :
    Routemap Out        :
    ORF type            : Prefix-list
    ORF capability      :
```

Showing BGP neighbor connection parameters for the neighbor with IP address *1.1.1.1*:

```
switch# show bgp vpnv4 unicast neighbors 1.1.1.1
Codes: ^ Inherited from peer-group

VRF : default

BGP Neighbor 1.1.1.1 (Internal)
    Description         : MPBGP Session to PE2
    Peer-group          :

    Remote Router Id    : 1.1.1.1           Local Router Id    : 4.4.4.4
    Remote AS           : 100               Local AS           : 100
    Remote Port         : 179               Local Port         : 38335
    State               : Established        Admin Status       : Up
    Conn. Established   : 1                  Conn. Dropped      : 0
    Passive             : No                 Update-Source      : loopback0
    Cfg. Hold Time      : 180                Cfg. Keep Alive    : 60
    Neg. Hold Time      : 180                Neg. Keep Alive    : 60
    Up/Down Time        : 00h:58m:52s        Connect-Retry Time : 120
    Local-AS Prepend    : No                 Alt. Local-AS      : 0
    BFD                 : Disabled
    Password            :
    Last Err Sent       : No Error
    Last SubErr Sent    : No Error
    Last Err Rcvd       : No Error
    Last SubErr Rcvd    : No Error

    Graceful-Restart    : Enabled            Gr. Restart Time   : 120
    Gr. Stalepath Time  : 300                Remove Private-AS  : No
    TTL                 : 255                Local Cluster-ID   :
    Weight              : 0                  Fall-over          : No
    Confederation-Peers : No

    Message statistics        Sent     Rcvd
    -------------------      -----    -----
    Open                         1        1
    Notification                 0        0
    Updates                      7        7
    Keepalives                  67       67
    Route Refresh                0        0
    Total                       75       75

    Capability                           Advertised      Received
    -----------                          -----------     ----------
    Route Refresh                        Yes             Yes
    Graceful Restart                     Yes             Yes
    Add-Path                             No              No
    Four Octet ASN                       Yes             Yes
    Address family IPv4 Unicast          No              No
    Address family IPv6 Unicast          No              No
    Address family VPNv4 Unicast         Yes             Yes
    Address family L2VPN EVPN            No              No
    Address Family : VPNv4 Unicast

    ------------------------------

    Rt. Reflect. Client : No                  Send Community    : both
    Allow-AS in         : 0                   Advt. Interval    : 30
    Max. Prefix         : 32500               Soft Reconfig In  :
    Nexthop-Self        :                     Default-Originate :
    Cfg. Add-Path       :
    Neg. Add-Path       :

    Routemap In         :
    Routemap Out        :
    ORF type            : Prefix-list
    ORF capability      :
```

Showing AS Path information of the vpnv4 routes in BGP RIB:

```
switch# show bgp vpnv4 unicast paths
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
              i internal, e external S Stale, R Removed, a additional-paths
VRF : default
```

```
Local Router-ID 4.4.4.4

    Network            Next Hop        PathID      Path

Route Distinguisher: 100:100              (Label 22)
* i 11.1.1.0/30        1.1.1.1         0            ?

Route Distinguisher: 1.1.1.1:200          (Label 23)
* i 11.1.2.0/30        1.1.1.1         0            ?

Route Distinguisher: 100:300              (Label 24)
* i 11.1.3.0/30        1.1.1.1         0            ?

Route Distinguisher: 100:400              (Label 25)
* i 11.1.4.0/30        1.1.1.1         0            ?
Total number of entries 4
```

Showing a summary of BGP neighbor status:

```
switch(config-bgp)# show bgp vpnv4 unicast summary
VRF : default
BGP Summary
Local AS               : 100          BGP Router Identifier  : 4.4.4.4
Peers                  : 0            Log Neighbor Changes   : No
Cfg. Hold Time         : 180          Cfg. Keep Alive        : 60
Confederation Id       : 0
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show capacities mpls

```
show capacities mpls
show capacities-status mpls
```

Description

For capacities command, shows the maximum number of label endpoints, label switch entries, and service label entries that can be configured on the device. For capacities-status command, shows the total number of label endpoints, label switch entries, and service label entries that are currently configured on the device.

Examples

Showing capacities of configurable MPLS options:

```
switch# show capacities mpls
System Capacities: Filter MPLS
Capacities Name
                           Value
----------------------------------------------------------------------------------
---------------------------------
Maximum number of MPLS Label Endpoints configurable in a system
                            8192
Maximum number of MPLS Label Switch entries configurable in a system
                            8192
Maximum number of MPLS Service Label entries configurable in a system
                            8192
```

Showing the configuration of currently configured MPLS options in relation to their capacities:

```
switch# show capacities-status mpls
System Capacities Status: Filter MPLS
Capacities Status Name
                          Value Maximum
----------------------------------------------------------------------------------
-------
Number of MPLS Label Endpoints currently configured
                              0    8192
Number of MPLS Label Switch entries currently configured
                              0    8192
Number of MPLS Service Label entries currently configured
                              0    8192
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Manager (#)	Administrators or local user group members with execution rights for this command.

show mpls forwarding

```
show mpls forwarding [detail]
```

Description

Shows the MPLS forwarding table.

Usage

- Forwarding table filters will be implemented at a later date.
- When running this command on a huge-scale setup, showing the full tables might take a while.

Examples

Showing the MPLS forwarding table:

```
switch# show mpls forwarding
MPLS Bindings
Entry Bindings   : 2
Exit Bindings    : 2
Transit Bindings : 1
PHP Mode         : Explicit-Null
QoS Mode         : Uniform
TTL Propagation  : Uniform
Entry Bindings:
Origin   Prefix              Ingress           Nexthop             Outgoing
Egress        Egress            Status
                             VRF               Address             Label
Interface     VRF
----------------------------------------------------------------------------------
---------------------------------------
LDP      4.4.4.4/32          default           192.168.10.2        3002     1/1/6
        default           operational
BGP      20.20.20.0/24      vrf-blue           4.4.4.4             5001     1/1/6
        default           operational
Exit Bindings:
Origin   Prefix              Incoming  Service   Egress            Status
Label     Label     VRF
-------------------------------------------------------------------------------
static   n/a                 exp-null  -         default           operational
BGP      n/a                 imp-null  2001      vrf-blue          operational
Transit Bindings:
Origin  Prefix       Incoming  Egress     Egress   Nexthop        Outgoing  Status
                     Label     Interface  VRF      Address        Label
----------------------------------------------------------------------------------
-----
LDP     4.4.4.4/32   2002      1/1/6      default  192.168.10.2   3002
operational
```

```
switch# show mpls forwarding detail
MPLS Bindings
Entry Bindings   : 2
Exit Bindings    : 2
Transit Bindings : 1
PHP Mode         : Explicit-Null
QoS Mode         : Uniform
TTL Propagation  : Uniform
Entry Bindings:
```

```
Origin   Prefix              Ingress           Nexthop             Outgoing
Egress        Egress            Status                 Tx Packets             Tx
Bytes
VRF               Address             Label     Interface     VRF
----------------------------------------------------------------------------------
---------------------------------------------------------------------------------
LDP      4.4.4.4/32          default           192.168.10.2        3002      1/1/6
        default           operational                    99                   100
BGP      20.20.20.0/24       vrf-blue          4.4.4.4             5001      1/1/6
        default           operational                    66                    88
Exit Bindings:
Origin   Prefix              Incoming  Service   Egress            Status
       Rx Packets             Rx Bytes
Label     Label     VRF
----------------------------------------------------------------------------------
---------------------------------------
static   n/a                 exp-null  -         default           operational
               33                   44
BGP      n/a                 imp-null  2001      vrf-blue          operational
               22                   33
Transit Bindings:
Origin   Prefix              Incoming  Egress        Egress              Nexthop
        Outgoing  Status                 Rx Packets             Rx Bytes
Tx Packets             Tx Bytes
Label     Interface     VRF               Address             Label
----------------------------------------------------------------------------------
----------------------------------------------------------------------------------
---------------------------------
LDP      4.4.4.4/32          2002      1/1/6        default
192.168.10.2        3002      operational                    11
22                   22                   33
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show mpls label-range static-lsp

```
show mpls label-range static-lsp
```

Description

Shows the range of MPLS labels allocated for use in static LSP bindings and the range of labels currently used by static LSP bindings.

Examples

Showing the range and usage of static LSp labels on the switch:

```
switch# show mpls label-range static-lsp

     Static LSP Labels

       Allocated : 16-100
       In use    : 16-30,35
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mpls ldp bindings

```
show mpls ldp bindings
```

Description

Shows information about all MPLS LDP bindings.

Examples

Showing information about MPLS LDP bindings:

```
switch# show mpls ldp bindings

10.10.2.0/24
        local binding: label: imp-null
        remote binding: lsr:10.255.255.255:0, label:16
        remote binding: lsr:10.256.256.256:0, label: exp-null
10.10.3.0/24
        local binding: label:20
        remote binding: lsr:10.256.256.256:0, label:22
```

```
5.43.9.98/32
        local binding: label:21
        No remote binding
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show mpls ldp discovery

```
show mpls ldp discovery [<IP-ADDR>]
no syntax
```

Description

Shows information about discovered LDP peers.

Parameter	Description
<IP-ADDR>	Specifies the peer MPLS LDP router ID in x.x.x.x format, where x is a decimal value from 0 to 255.

Examples

Showing information about discovered LDP peers:

```
switch# show mpls ldp discovery
Local LDP Identifier: 10.44.44.44:0
Discovery Sources:
     Interfaces:
         1/1/1 : recv
         LDP Id: 10.33.33.33:0, Transport address: 10.33.33.33
                 Path vector limit: 10
                 Distribution type: Downstream-on-demand
                 Adjacency type: Link
                 Hold time: 15 sec (local: 15 sec, peer: 15 sec, remaining: 10s)
                 BFD status: Activating
         1/1/2 : recv
         LDP Id: 10.33.33.34:0, Transport address: 10.33.33.33
```

```
                 Path vector limit: 10
                 Distribution type: Downstream-unsolicited
                 Adjacency type: Targeted
                 Hold time: 15 sec (local: 15 sec, peer: 15 sec, remaining: 10s)
                 BFD status: Active

Local LDP Identifier: 10.44.44.44:2
Discovery Sources:
    Interfaces:
        1/1/3 : recv
        LDP Id: 10.33.38.33:0, Transport address: 10.43.33.33
                Path vector limit: 10
                Distribution type: Downstream-unsolicited
                Adjacency type: Link
                Hold time: 15 sec (local: 15 sec, peer: 15 sec, remaining: 10s)
                BFD status: Active
```

Showingu information about a specific LDP peer:

```
switch# show mpls ldp discovery 10.33.33.34
Local LDP Identifier: 10.44.44.44:0
Discovery Sources:
    Interfaces:
        1/1/2 : recv
        LDP Id: 10.33.33.34:0, Transport address: 10.33.33.33
                Path vector limit: 10
                Distribution type: Downstream-unsolicited
                Adjacency type: Targeted
                Hold time: 15 sec (local: 15 sec, peer: 15 sec, remaining: 10s)
                BFD status: Active
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show mpls ldp graceful-restart

```
show mpls ldp graceful-restart
```

Description

Shows graceful restart parameters and status.

Examples

Showing graceful restart parameters and status when graceful restart is not configured:

```
switch# show mpls ldp graceful-restart
Max recovery time                        : 50 sec
Neighbor liveness time                   : 50 sec
Forwarding holding time                  : 70 sec
Number of graceful restart events        : 7
Graceful restart in progress             : true
Forwarding holding time remaining        : 300 sec
Current graceful restart status          : in-progress
Graceful restart exit history (last 5) : complete, complete, complete, cancelled,
cancelled
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show mpls ldp neighbor

`show mpls ldp neighbor`

Description

Shows information about LDP neighbors in the current session(s). The reconnect and recovery time are the times advertised by the peer device.

Examples

Showing LDP neighbors:

```
switch# show mpls ldp neighbor
Local LDP Identifier: 10.44.44.44:0, Peer LDP Identifier: 10.22.22.22:0
    TCP connection: 10.22.22.22:646 - 10.33.33.33:65530
    Graceful Restart: No
    Session Holdtime: 180 sec
    State: Operational; Msgs sent/rcvd: 46/43
    Up time: 00:31:21
    LDP Discovery Sources: 1/1/1
    Addresses bound to this peer:
         10.22.22.22 10.10.2.1
```

Showing LDP neighbors when graceful restart has been configured:

```
switch# show mpls ldp neighbor
Local LDP Identifier: 1.1.1.1:0, Peer LDP Identifier: 11.1.1.2:0
    Graceful Restart: Yes
    Peer Reconnect Time: 120 sec
    Peer Recovery Time: 300 sec
    Session Holdtime: 40 sec
    Up time: 00:02:59
    State: operational
    LDP Discovery Sources: 1/1/32
    Addresses bound to this peer:
         11.1.1.2 12.1.1.1 2.2.2.2
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

static-lsp

```
static-lsp
no static-lsp
```

Description

Configures MPLS static Label Switched Paths (LSP).

The **no** form of this command removes all static LSP configurations including label range allocation and static LSP binding.

Examples

Configuring MPLS static LSP:

```
switch(config-mpls)# static-lsp
```

Removing MPLS static LSP configuration:

```
switch(config-mpls)# no static-lsp
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-mpls`	Administrators or local user group members with execution rights for this command.

traceroute mpls

`traceroute mpls ipv4 <IP-ADDR/MASK> [source <IP-ADDR> | destination <IP-ADDR> | ttl <HOPS> | timeout <TIME> | fec-type ldp]`

Description

Send LSP ping packets on the MPLS network and display the responses all intermediate routers as well as the destination host. Use this command as a debugging and analytics tool to verify connectivity within the MPLS networks.

Parameter	Description
`ipv4 <IP-ADDR/MASK>`	Specifies the IP address and netmask of the remote subnet to traceroute.
`source <IP-ADDR>`	Specifies the source IPv4 address for the request packet.
`destination <IP-ADDR>`	Specifies the destination IPv4 address for the request packet
`ttl <HOPS>`	Specifies the max number of hops a packet can take en route to its destination. Range: 1-255. Default: 255.
`timeout <SECONDS>`	Specifies the number of seconds after which a packet is considered dropped. Range: 1-60 seconds. Default: 2.
`fec-type ldp`	Selects the target Forward Equivalence Class (FEC) type. The only supported option is the default value of ldp.

Example

Successfully tracing the route a target with IP address 1.1.4.1/32 with a maximum TTL of 3 hops and a 3 second timeout:

```
switch# traceroute mpls ipv4 1.1.4.1/32 ttl 3 timeout 3
Tracing MPLS Label Switched Path to 1.1.4.1/32 from source 10.0.0.2,
timeout is 3 seconds and ttl is 3

Codes: '!' - success, 'Q' - request not sent, '.' - timeout, 'N' - no label entry,
  'R' - transit router, 'D' - DS Map mismatch, 'F' - no FEC mapping,
  'M' - malformed request, ‘T' - unsupported tlvs, ‘Z' - return code 0

Type escape sequence to abort.
  0 10.0.0.2 MRU 1500 [Labels: 17]
R 1 10.0.0.1 MRU 1500 [Labels: explicit-null] 10 ms
! 2 10.0.1.2 1 ms
```

For more information on features that use this command, refer to the MPLS Guide for your switch model.

Command History

Release	Modification
10.11	Support for the Aruba 6400 Series Switch added.
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6400	`Manager (#)`	Administrators or local user group members with execution rights for this command.

Chapter 85

MSDP router config commands

disable

`disable`

Description

Disables MSDP on the VRF.

Example

Disabling MSDP:

```
switch(config)# router msdp
switch(config-msdp)# disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables MSDP on the VRF.

Example

Enabling MSDP:

```
switch(config)# router msdp
switch(config-msdp)# enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp`	Administrators or local user group members with execution rights for this command.

router msdp

```
router msdp [vrf <VRF-NAME>]
no router msdp [vrf <VRF-NAME>]
```

Description

Changes the current context to the MSDP router context. If no VRF is specified, the default VRF MSDP context of the router is assumed.

The **no** form of this command removes the MSDP configuration from the specified context or the default VRF.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the context to the specified VRF.

Examples

Configuring default MSDP router context:

```
switch(config)# router msdp
switch(config-msdp)#
```

Configuring specified router MSDP:

```
switch(config-msdp)# router msdp vrf red
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

sa-interval

```
sa-interval <INTERVAL-VALUE>
no sa-interval
```

Description

Configures the sa-interval for the frequency at which MSDP source-active messages are sent.

The **no** form of this command sets the interval to the default value of 60 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the sa-interval in seconds. Default: 60 seconds. Range 60-65535.

Examples

Configuring the sa-interval:

```
switch(config)# router msdp
switch(config-msdp)# sa-interval 400
switch(config-msdp)# no sa-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp`	Administrators or local user group members with execution rights for this command.

sa-limit

```
sa-limit <LIMIT-VALUE>
no sa-limit <LIMIT-VALUE>
```

Description

Configures the SA (Source Active) cache limit for the MSDP peer.

The **no** form of this command sets the cache limit to the default value.

Parameter	Description
<LIMIT-VALUE>	Specifies the sa cache limit. MSDP peer limit: 64, Cache Limit: 8K

Usage

This command is used to limit the overall number of (S, G) entries that a device can accept from specified MSDP peers and store in a sa-cache. When configured, the device maintains a per-peer count of (S, G) messages stored in the SA cache and ignores new messages from a peer if the configured sa-limit for that peer has been reached. This command protects MSDP-enabled devices from denial of service (DOS) attacks.

By default, there is no limit configured per peer. All (S, G) entries within the system capacities are allowed. If there is a reboot or HA switchover, the (S, G) cache allocation occurs based on FCFS basis. When configured via CLI or REST, (S, G) entries are allocated until they reach the system capacity or peer limit based on whichever is reached first and new sets of (S, G) requests are discarded.

Examples

Configuring the sa cache limit to 1000:

```
switch(config)# router msdp
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# sa-limit 1000
```

Removing the configured sa cache limit of 1000:

```
switch(config)# router msdp
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# no sa-limit 1000
```

Configuring the sa cache limit outside system capacities:

```
switch(config)# router msdp
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# sa-limit 20000
Specified value exceeds the system capacities. Maximum SA Allowed on the system is
16384.
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp`	Administrators or local user group members with execution rights for this command.

Chapter 86

MSDP peer configuration commands

connection-retry-interval

```
connection-retry-interval <INTERVAL-VALUE>
no connection-retry-interval
```

Description

Configures the connection-retry-interval for which MSDP peers will wait after peering sessions are reset, before attempting to re-establish the peering sessions.

The **no** form of this command removes the currently configured value and sets it to the default value of 30 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specify connection-retry-interval in seconds. Range: 1-65535.

Example

Configuring the connection-retry-interval:

```
switch(config-msdp-peer)# connection-retry-interval 120
switch(config-msdp-peer)# no connection-retry-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.

connect-source

```
connect-source <INTERFACE-NAME>
```

Description

Configures the connection source interface for the MSDP Peer.

The **no** form of this command removes the existing connection source interface and resets the peer connection.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to use as a source.

Examples

Configuring the connection source interface:

```
switch(config-msdp-peer)# connect-source 1/1/1
```

Configuring the connection source as ROP:

```
switch(config)# router msdp
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)# connect-source 1/1/1
```

Configuring the connection source as a sub-interface:

Supported only on the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# router msdp
switch(config-msdp)# ip msdp peer 20.1.1.1
switch(config-msdp-peer)# connect-source 1/1/10.10
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.

clear ip msdp peer statistics

```
clear ip msdp peer [all-vrfs | vrf <VRF-NAME> | <PEER-IP>]
```

Description

Clears MSDP SA counters of peer information for the given VRF. If VRF is not specified, it clears SA counters of peers in the default VRF. It also clears MSDP SA counters for a specified peer address.

Parameter	Description
`all-vrfs`	Clears MSDP peer information for all VRFs. Optional.
`vrf <VRF-NAME>`	Clears MSDP peer information for a particular VRF. If the **<VRF-NAME>** is not specified, it clears information for the default VRF. Optional
`<PEER-IP>`	Clears MSDP peer information for the specified Peer IP. Format: A.B.C.D. Optional.

Examples

Showing MSDP peer information for VRFs:

```
switch# clear ip msdp peer statistics all-vrfs
switch# clear ip msdp peer statistics 2.2.2.2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only.

description

```
description <TEXT>
no description
```

Description

Configures a description for a specified MSDP peer to make it easier to identify in a configuration or show command output.

The **no** form of this command removes the peer description.

Parameter	Description
<TEXT>	Specifies a description for the MSDP Peer.

Example

Configuring the MSDP peer description:

```
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# description Peer_1
switch(config-msdp-peer)# no description
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-msdp-peer	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables MSDP peer on the L3 interface.

Example

Disabling MSDP peering:

```
switch(config)# router msdp
switch(config-msdp)#
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.

enable (ip msdp peer)

```
enable
```

Description

Enables MSDP peer on the L3 interface.

Only one MSDP peering session per VRF should be configured between two routers to avoid loops.

Example

Enabling MSDP peering:

```
switch(config)# router msdp
switch(config-msdp)#
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.

ip msdp peer

```
ip msdp peer <IP-ADDR>
no ip msdp peer
```

Description

Changes the current context to the MSDP peer context.

The **no** form of this command removes the MSDP peer configuration from the specified context.

Parameter	Description
<IP-ADDR>	Specifies the IPv4 address of the MSDP peer. Format: A.B.C.D

Examples

Enabling the MSDP peer context:

```
switch(config)# router msdp
switch(config-msdp)#
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp`	Administrators or local user group members with execution rights for this command.

keepalive

```
keepalive <KEEPALIVE-INTERVAL> <HOLD-TIME>
no keepalive
```

Description

Configures the interval at which a MSDP peer will send keepalive messages, and the interval at which the MSDP peer will wait for keepalive messages from other peers before declaring them down.

The **no** form of this command removes the currently configured value and sets it to the default value.

Parameter	Description
<KEEPALIVE-INTERVAL>	Specifies the value for the keepalive interval.
<HOLD-TIME>	Specifies the value for the hold time.

Example

Configuring the keepalive interval and the hold time for MSDP peer:

```
switch(config-msdp-peer)# keepalive 30 45
switch(config-msdp-peer)# no keepalive
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.

mesh-group

```
mesh-group <MESH-NAME>
no mesh-group <MESH-NAME>
```

Description

Associates the given mesh group with the MSDP peer. This feature is used to reduce the amount of SA traffic in an intra-domain setting.

The **no** form of this command removes the peer from the currently configured mesh.

Parameter	Description
<MESH-NAME>	Specifies the MSDP mesh group name.

Usage

All MSDP peers on the router that participate in the mesh group must be fully meshed with all other peers in the mesh group. When MSDP mesh groups are used, SA messages are not flooded to other mesh group peers. It also eliminates RPF checks on arriving SA messages. With MSDP mesh group configured, SA messages are always accepted from mesh group peers.

Example

Associating a mesh group with an MSDP peer:

```
switch(config-msdp-peer)# mesh-group test-mesh-group
```

Removing the MSDP peer from the configured mesh:

```
switch(config-msdp-peer)# no mesh-group test-mesh-group
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.

password (router msdp)

```
password {ciphertext | plaintext} <password>
no password
```

Description

Enables MD5 password encryption for a TCP connection between two MSDP peers.

The **no** form of this command removes MD5 password encryption.

Parameter	Description
`{ciphertext | plaintext}`	Selects the password type.
`<password>`	Specifies the password.

When the password is not provided on the command line, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

Examples

Configuring MD5 password encryption with a provided plaintext password:

```
switch(config)# router msdp
switch(config-msdp)#
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# password plaintext F82#4eva
```

Configuring MD5 password encryption with a prompted plaintext password:

```
switch(config)# router msdp
switch(config-msdp)#
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# password
Enter the MD5 password: ********
Re-Enter the MD5 password: ********
```

Removing MD5 password encryption:

```
switch(config)# router msdp
switch(config-msdp)#
switch(config-msdp)# ip msdp peer 10.1.1.1
switch(config-msdp-peer)#
switch(config-msdp-peer)# no password
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.

sa-filter access-list

```
sa-filter {in|out} access-list <ACL-RULE>
no sa-filter {in|out} access-list <ACL-RULE>
```

Description

Associates the given ACL to filter MSDP SA messages on the peer.

The **no** form of this command removes the currently configured ACL entry.

Parameter	Description
`{in|out}`	Enables the filter for incoming or outgoing SA messages.
`<ACL-RULE>`	Specifies the ACL rule name.

Usage

By default, the MSDP enabled router forwards all the SA messages, and the peer router processes all the received messages. This command allows the user to configure an ACL on the MSDP peer to filter SA messages. User can prevent the incoming/outgoing SA messages on MSDP router by creating incoming/outgoing filter lists using an ACL.

Example

Filtering incoming SA messages on the MSDP peer for the specified ACL:

```
switch(config-msdp-peer)# sa-filter in access-list msdp_sa_filter1
```

Filtering outgoing SA messages on the MSDP peer for the specified ACL:

```
switch(config-msdp-peer)# sa-filter out access-list msdp_sa_filter2
```

Removing filter on the MSDP peer for the specified ACL:

```
switch(config-msdp-peer)# no sa-filter in access-list msdp_sa_filter2
```

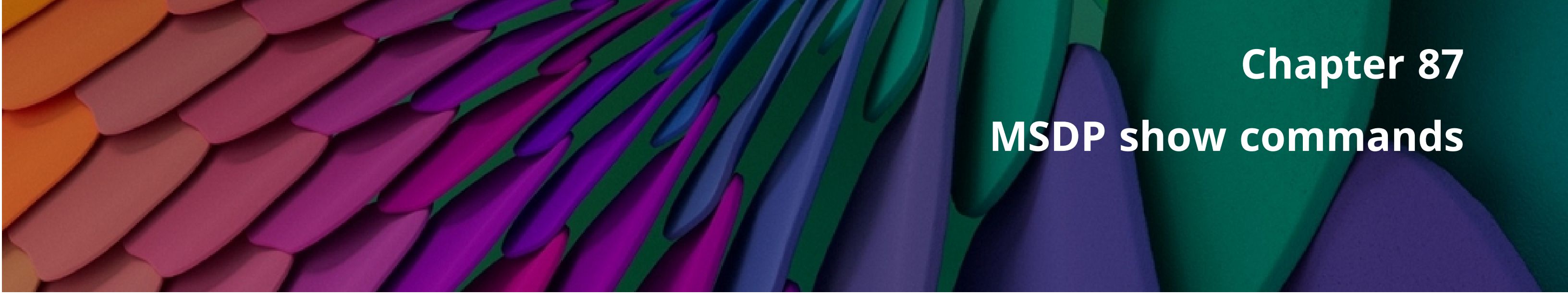
For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-msdp-peer`	Administrators or local user group members with execution rights for this command.



Chapter 87

MSDP show commands

show ip msdp count

```
show ip msdp count [all-vrfs | vrf <VRF-NAME>]
```

Description

Shows MSDP Peer (S,G) learnt count for a given VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows MSDP (S,G) entries count for all VRFs. Optional.
`vrf <VRF-NAME>`	Shows MSDP (S,G) entries count for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF. Optional.

Examples

Showing the MSDP learnt count:

```
switch# show ip msdp count

VRF: default
SA state per Peer counters
<Peer>:<#SA learned>
10.1.1.1: 30
20.1.1.1: 100
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show ip msdp peer

`show ip msdp peer [all-vrfs | vrf <VRF-NAME> | <PEER-IP>]`

Description

Shows MSDP Peer information for the given VRF. Optionally, you can show specific information by VRF.

Parameter	Description
`all-vrfs`	Shows MSDP peer information for all VRFs. Optional.
`vrf <VRF-NAME>`	Shows MSDP peer information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF. Optional.
`<PEER-IP>`	Shows MSDP Peer information for specified Peer IP. Format: A.B.C.D. Optional.

Examples

Showing MSDP peer information for VRFs:

(Sub-interface is supported only on the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series)

```
switch# show ip msdp peer

VRF: default

MSDP Peer: 10.1.1.1
Connection status
State: up  Resets: 0  Connection Source: 1/1/1
Uptime(Downtime): 0m 25s    SA Messages sent: 0
SA's learned from this peer: 0
SA Filtering
Input  (S,G) filter: msdp_sa_filter1  (S,G) entries dropped: 0
Output (S,G) filter: msdp_sa_filter2  (S,G) entries dropped: 30
Mesh group: test-mesh-group


MSDP Peer: 30.1.1.1
Connection status
State: up  Resets: 0  Connection Source: 1/1/10.10(30.1.1.2)
Uptime(Downtime): 0m 25s    SA Messages sent: 0
SA's learned from this peer: 0
Peer Keepalive interval: 70
Peer Hold time: 90
Peer Connection Retry interval: 40
SA Filtering
Input  (S,G) filter: msdp_sa_filter1  (S,G) entries dropped: 0
Output (S,G) filter: msdp_sa_filter2  (S,G) entries dropped: 30
Mesh group: test-mesh-group1

switch# show ip msdp peer 20.1.1.1

VRF: default

MSDP Peer: 20.1.1.1
Connection status
State: down  Resets: 0  Connection Source: 1/1/2
Uptime(Downtime): 1m 25s    SA Messages sent: 0
```

```
SA's learned from this peer: 0
SA Filtering
Input (S,G) filter: msdp_sa_filter1  (S,G) entries dropped: 0
Output (S,G) filter: msdp_sa_filter2  (S,G) entries dropped: 20
Mesh group: test-mesh-group
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show ip msdp sa-cache

`show ip msdp sa-cache [all-vrfs | vrf <VRF-NAME> | <SRC-OR-GRP-IP>]`

Description

Shows MSDP Peer SA-Cache information for the given VRF. Optionally, you can show specific information by VRF. The SA-Cache output can be filtered based on the source or group IPv4 address.

Parameter	Description
`all-vrfs`	Shows MSDP SA-Cache information for all VRFs. Optional.
`vrf <VRF-NAME>`	Shows MSDP SA-Cache information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF. Optional.
`<SRC-OR-GRP-IP>`	Shows the filtered SA-cache output for the specified source or group IPv4 address. Format: A.B.C.D. Optional.

Examples

Showing MSDP SA-Cache information for VRFs:

```
switch# show ip msdp sa-cache

VRF: default
(30.0.0.1, 230.1.1.1)  RP: 10.1.1.1  Peer: 10.1.1.2
```

```
(20.0.0.1, 229.1.1.1)  RP: 10.1.1.1  Peer: 10.1.1.2
(10.0.0.1, 229.1.1.1)  RP: 10.1.1.1  Peer: 10.1.1.2

Total entries: 3

switch# show ip msdp sa-cache 229.1.1.1
(20.0.0.1, 229.1.1.1)  RP: 10.1.1.1  Peer: 10.1.1.2
(10.0.0.1, 229.1.1.1)  RP: 10.1.1.1  Peer: 10.1.1.2

Total entries: 2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show ip msdp summary

`show ip msdp summary [all-vrfs | vrf <VRF-NAME>]`

Description

Shows MSDP peer summary for a given VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows the MSDP peer summary for all VRFs. Optional.
`vrf <VRF-NAME>`	Shows the MSDP peer summary for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF. Optional.

Examples

Showing the MSDP peer summary:

```
switch# show ip msdp summary

VRF: default
```

```
MSDP Peer Status Summary
Peer address      State    Uptime(Downtime)      Reset Count      SA Count

10.1.1.1          down     34m 34s               0                0
20.1.1.1          up       50m 24s               0                50
```

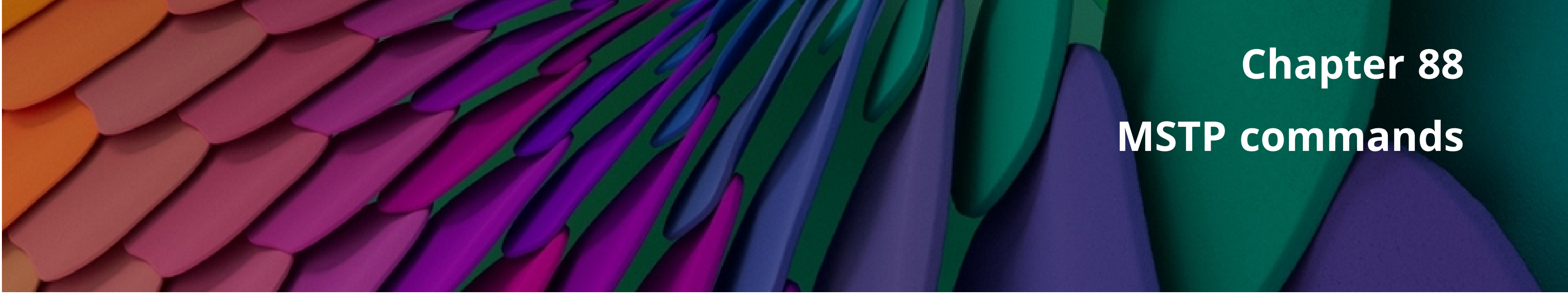
For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 88

MSTP commands

clear spanning-tree statistics

```
clear spanning-tree statistics
```

Description

Clears the spanning tree BPDU statistics.

Example

Clearing the spanning tree BPDU statistics:

```
switch(config)# clear spanning-tree statistics
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show spanning-tree

```
show spanning-tree [vsx-peer]
```

Description

Shows priority, address, Hello-time, Max-age, and Forward-delay for bridge and root node.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the

Parameter	Description
	VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing spanning tree standard information:

```
switch# show spanning-tree
Spanning tree status      : Enabled Protocol: MSTP

MST0
  Root ID
    Priority      : 32768, Root
    MAC-Address   : 48:0F:CF:AF:04:76
    Hello time(in seconds):2   Max Age(in seconds):20
    Forward Delay(in seconds):15

  Bridge ID
    Priority      : 32768
    MAC-Address   : 48:0F:CF:AF:04:76
    Hello time(in seconds):2   Max Age(in seconds):20
    Forward Delay(in seconds):15

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Root        Forwarding 2000       128       P2P       100        60
  20         10
1/1/8    Alternate   Blocking   20000      128       P2P       100        60
  20         10
1/1/9    Disabled    Down       20000      128       P2P       100        60
  20         10

Number of topology changes    : 4
Last topology change occurred : 516 seconds ago
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	A new state `Down` is added in the output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree detail

```
show spanning-tree detail [vsx-peer]
```

Description

Shows spanning tree detail including CIST and corresponding port information.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing spanning tree detailed information:

```
switch# show spanning-tree detail
Spanning tree status      : Enabled Protocol: MSTP

MST0
  Root ID
    Priority      : 32768, Root
    MAC-Address   : 48:0F:CF:AF:04:76
    Hello time(in seconds):2     Max Age(in seconds):20
    Forward Delay(in seconds):15

  Bridge ID
    Priority      : 32768
    MAC-Address   : 48:0F:CF:AF:04:76
    Hello time(in seconds):2  Max Age(in seconds):20
    Forward Delay(in seconds):15

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
```

```
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Disabled    Down       20000      128       P2P       100        60
  20         10


Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago
Hello expiry                  : 1 second
Forward delay expiry          : 18 seconds

Port 1/1/1
Designated root has priority              : 32768          Address:
48:0F:CF:AF:04:76
Designated bridge has priority            : 32768          Address:
48:0F:CF:AF:04:76
Designated port                           : 1/1/1
Number of transitions to forwarding state : 3
BPDUs sent                                : 347
BPDUs received                            : 9
TCN_Tx: 20, TCN_Rx: 10

Port 1/1/2
Designated root has priority              : 32768          Address:
48:0F:CF:AF:04:76
Designated bridge has priority            : 32768          Address:
48:0F:CF:AF:04:76
Designated port                           : 1/1/2
Number of transitions to forwarding state : 3
BPDUs sent                                : 350
BPDUs received                            : 11
TCN_Tx: 20, TCN_Rx: 10

Port lag1 ID 321
Designated root has priority              : 32768          Address:
48:0F:CF:AF:04:76
Designated bridge has priority            : 32768          Address:
48:0F:CF:AF:04:76
Designated port id                        : 321
Multi-Chassis role                        : active
Number of transitions to forwarding state : 3
BPDUs sent                                : 340
BPDUs received                            : 5
TCN_Tx: 20, TCN_Rx: 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	A new state `Down` is added in the output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree inconsistent-ports

`show spanning-tree inconsistent-ports [instance <INSTANCE-ID>]`

Description

Shows ports blocked by STP protection functions such as Root guard, Loop guard, BPDU guard, and RPVST guard in addition to MSTI information.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTP instance ID. Range: 0 to 64.

Example

On the 6400 Switch Series, interface identification differs.

Showing spanning tree inconsistent ports:

```
switch# show spanning-tree inconsistent-ports
Instance ID  Blocked Port   Reason
------------ -------------- ------------
0            1/1/13         BPDU Guard
```

Showing inconsistent port information for instances 1-4:

```
switch# show spanning-tree inconsistent-ports instance 1-4
Instance ID  Blocked Port   Reason
------------ -------------- ------------
1            1/1/3          Root Guard
2            1/1/7          BPDU Guard
3            1/1/9          Loop Guard
4            1/1/37         RPVST Guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree mst

```
show spanning-tree mst [vsx-peer]
```

Description

Shows MSTP configuration and status information for each instance.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing MSTP configuration and status information:

```
switch# show spanning-tree mst
#### MST0
Vlans mapped   : 2,4-4094
Bridge Address : 48:0F:CF:AF:04:76
Priority       : 32768
Root
Regional Root
Operational    Hello time    : 2 seconds                  Forward delay: 15 seconds
               Max-age       : 20 seconds                 TxHoldCount  : 6 pps
Configured     Hello time    : 2 seconds                  Forward delay: 15 seconds
               Max-age       : 20 seconds                 Max-Hops     : 20
Root           Address       : 48:0F:CF:AF:04:76          Priority     : 32768
               Port          : 0                          Path cost    : 0
Regional Root  Address       : 48:0F:CF:AF:04:76          Priority     : 32768
               Internal cost: 0                           Rem Hops     : 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ---------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
```

```
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20        10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20        10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20        10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20        10
1/1/7    Disabled    Down       20000      128       P2P       100        60
  20        10


Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago

#### MST1
Vlans mapped:  1
Bridge         Address : 48:0F:CF:AF:04:76          Priority: 32768
Root           Address : 48:0F:CF:AF:04:76          Priority: 32768
               Port    : 0                          Cost    : 0
               Rem Hops: 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20        10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20        10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20        10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20        10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20        10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20        10
1/1/7    Disabled    Down       20000      128       P2P       100        60
  20        10

Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago

#### MST2
Vlans mapped:  3
Bridge         Address : 48:0F:CF:AF:04:76          Priority: 32768
Root           Address : 48:0F:CF:AF:04:76          Priority: 32768
               Port    : 0                          Cost    : 0
               Rem Hops: 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20        10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20        10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
```

```
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10

Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	A new state `Down` is added in the output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree mst-config

```
show spanning-tree mst-config [vsx-peer]
```

Description

Shows MSTP instance and corresponding VLAN information.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing configuration information for MST instances and corresponding VLANs:

```
switch# show spanning-tree mst-config
MST configuration information
```

```
   MST config ID        : reg
   MST config revision  : 1
   MST config digest    : 2D2BC9A32097B463C48EE1817673FA2D
   Number of instances  : 2

Instance ID     Member VLANs
--------------- ----------------------------------
0               2,4-4094
1               1
2               3
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree mst detail

```
show spanning-tree mst detail [vsx-peer]
```

Description

Shows detailed information for all MST instances.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing detailed information for all MST instances:

```
switch# show spanning-tree mst detail
#### MST0
Vlans mapped:  2,4-4094
```

```
Bridge         Address: 48:0F:CF:AF:04:76          Priority: 32768
Root
Regional Root
Operational    Hello time   : 2 seconds                 Forward delay: 15 seconds
               Max-age      : 20 seconds                TxHoldCount  : 6 pps
Configured     Hello time   : 2 seconds                 Forward delay: 15 seconds
               Max-age      : 20 seconds                Max-Hops     : 20
Root           Address      : 48:0F:CF:AF:04:76         Priority     : 32768
               Port         : 0                         Path cost    : 0
Regional Root  Address      : 48:0F:CF:AF:04:76         Priority     : 32768
               Internal cost: 0                         Rem Hops     : 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Disabled    Down       20000      128       P2P       100        60
  20         10

Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago

Port 1/1/1
Designated root address            : 48:0F:CF:AF:04:76
Designated regional root address   : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 638
BPDUs received                     : 9
Message expiry                     : 1 second
Forward delay expiry               : 18 seconds
Forward transitions                : 3
TCN_Tx: 10, TCN_Rx: 10

Port 1/1/2
Designated root address            : 48:0F:CF:AF:04:76
Designated regional root address   : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 641
BPDUs received                     : 11
Message expiry                     : 1 second
Forward delay expiry               : 18 seconds
Forward transitions                : 3
TCN_Tx: 10, TCN_Rx: 10

#### MST1
Vlans mapped:  1
Bridge         Address : 48:0F:CF:AF:04:76          Priority: 32768
```

```
Root           Address : 48:0F:CF:AF:04:76          Priority: 32768
               Port    : 0                          Cost    : 0
               Rem Hops: 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Disabled    Down       20000      128       P2P       100        60
  20         10

Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago

Port 1/1/1
Designated root address            : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 638
BPDUs received                     : 9
Message expiry                     : 1 second
Forward delay expiry               : 18 seconds
Forward transitions                : 4
TCN_Tx: 10, TCN_Rx: 10

Port 1/1/2
Designated root address            : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 641
BPDUs received                     : 11
Message expiry                     : 1 second
Forward delay expiry               : 18 seconds
Forward transitions                : 4
TCN_Tx: 10, TCN_Rx: 10


#### MST2
Vlans mapped:  3
Bridge         Address : 48:0F:CF:AF:04:76          Priority: 32768
Root           Address : 48:0F:CF:AF:04:76          Priority: 32768
               Port    : 0                          Cost    : 0
               Rem Hops: 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
```

```
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Disabled    Down       20000      128       P2P       100        60
  20         10

Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago

Port 1/1/1
Designated root address            : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 638
BPDUs received                     : 9
Message expiry                     : 1 second
Forward delay expiry               : 18 seconds
Forward transitions                : 3
TCN_Tx: 10, TCN_Rx: 10

Port 1/1/2
Designated root address            : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 641
BPDUs received                     : 11
Message expiry                     : 1 second
Forward delay expiry               : 18 seconds
Forward transitions                : 3
TCN_Tx: 10, TCN_Rx: 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	A new state **Down** is added in the output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree mst <INSTANCE-ID>

```
show spanning-tree mst <INSTANCE-ID> [vsx-peer]
```

Description

Displays MSTP configurations for the given instance ID.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTP instance number. Range: 0 to 64.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show spanning-tree mst 1

#### MST1
Vlans mapped:  1
Bridge         Address : 48:0F:CF:AF:04:76          Priority: 32768
Root           Address : 48:0F:CF:AF:04:76          Priority: 32768
               Port    : 0                          Cost    : 0
               Rem Hops: 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
--------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ----------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Disabled    Down       20000      128       P2P Bound 100        60
  20         10

Topology change flag           : True
Number of topology changes     : 4
Last topology change occurred : 516 seconds ago
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	A new state **Down** is added in the output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree mst <INSTANCE-ID> detail

`show spanning-tree mst <INSTANCE-ID> detail [vsx-peer]`

Description

Displays MSTP configurations for the given instance ID with corresponding port details.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTP instance number. Range: 0 to 64.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show spanning-tree mst 1 detail


#### MST1
Vlans mapped:  1
Bridge         Address : 48:0F:CF:AF:04:76          Priority: 32768
Root           Address : 48:0F:CF:AF:04:76          Priority: 32768
               Port    : 0                          Cost    : 0
               Rem Hops: 20

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
```

```
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Disabled    Down       20000      128       P2P Bound 100        60
  20         10

Topology change flag          : True
Number of topology changes    : 4
Last topology change occurred : 516 seconds ago

Port 1/1/1
Designated root address            : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 667
BPDUs received                     : 9
Message expiry                     : 0 second
Forward delay expiry               : 18 seconds
Forward transitions                : 4
TCN_Tx: 10, TCN_Rx: 10

Port 1/1/2
Designated root address            : 48:0F:CF:AF:04:76
Designated bridge address          : 48:0F:CF:AF:04:76
Priority                           : 32768
BPDUs sent                         : 670
BPDUs received                     : 11
Message expiry                     : 0 second
Forward delay expiry               : 18 seconds
Forward transitions                : 4
TCN_Tx: 10, TCN_Rx: 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	A new state **Down** is added in the output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree mst interface

`show spanning-tree mst <INSTANCE-ID> interface <IFNAME> [vsx-peer]`

Description

Shows MSTP configurations for the given instance ID with corresponding port details.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTP instance number. Range: 0 to 64.
<IFNAME>	Specifies an interface.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing MST configuration and port details:

```
switch# show spanning-tree mst 1 interface 1/1/1
Port 1/1/1

Instance       Role           State        Cost       Priority   Vlans mapped
-------------- -------------- ------------ ---------- ---------- ----------
1              Designated     Forwarding   20000      128        1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree summary port

```
show spanning-tree summary port
```

Description

Shows spanning tree port summary information.

Example

On the 6400 Switch Series, interface identification differs.

Showing summary of spanning tree ports:

```
switch# show spanning-tree summary port

STP status                      : Enabled
Protocol                        : MSTP
BPDU guard timeout value        : None
BPDU guard enabled interfaces   : 1/1/1-1/1/9,1/1/11,1/1/13,1/1/15,1/1/17,1/1/19,
                                  1/1/21,lag1,lag2
BPDU filter enabled interfaces  : None
Root guard enabled interfaces   : 1/1/3
Loop guard enabled interfaces   : 1/1/2
TCN guard enabled interfaces    : 1/1/1-1/1/3
RPVST filter enabled interfaces : 1/1/37
RPVST guard enabled interfaces  : None

Interface count by state

Instance ID   Blocking Listening Learning Forwarding Down
------------- -------- --------- -------- ---------- ----
0                    2         0        0         15    0
1                    2         0        0         15    0
2                    2         0        0         15    0
------------- -------- --------- -------- ---------- ----
Total = 3            6         0        0         45    0
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.09	A new state `Down` is added in the output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (`>`) or Manager (`#`)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show spanning-tree summary root

`show spanning-tree summary root`

Description

Shows spanning tree root summary information.

Example

On the 6400 Switch Series, interface identification differs.

Showing spanning tree root summary:

```
switch# show spanning-tree summary root

STP status                   : Enabled
Protocol                     : MSTP
System ID                    : 70:72:cf:32:50:f5

Root bridge for STP Instance : 0,1,2

                                                Root Hello Max Fwd
Instance ID     Priority Root ID                cost  Time Age Dly    Root Port
--------------- -------- ----------------- --------- ----- --- --- ------------
0                  32768 70:72:cf:32:50:f5         0     2  20  15          n/a
1                  32768 70:72:cf:32:50:f5         0     2  20  15          n/a
2                  32768 70:72:cf:32:50:f5       200     2  20  15        1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

spanning-tree

```
spanning-tree
no spanning-tree
```

Description

Enables the spanning tree protocol on the switch.

The **no** form of this command disables the spanning tree protocol on the switch.

Examples

Enabling spanning tree:

```
switch(config)# spanning-tree
```

Disabling spanning tree:

```
switch(config)# no spanning-tree
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree bpdu-filter

```
spanning-tree bpdu-filter
no spanning-tree bpdu-filter
```

Description

Enables the bpdu filter for the interface.

The BPDU filter feature allows control of spanning tree participation on a per-port basis. It can be used to exclude specific ports from becoming part of spanning tree operations. A port with the BPDU filter enabled will ignore incoming BPDU packets, does not transmit BPDU, and stays locked in the spanning tree forwarding state. All other ports maintain their role. Typical uses for this parameter include:

- To have MSTP operations running on selected ports of the switch rather than every port of the switch at a time.
- To prevent the spread of errant BPDU frames.
- To eliminate the need for a topology change when a port's link status changes. For example, ports that connect to servers and workstations can be configured to remain outside of spanning tree operations.
- To protect the network from denial of service attacks that use spoofing BPDUs by dropping incoming BPDU frames. For this scenario, BPDU protection offers a more secure alternative, implementing port shut down and a detection alert when errant BPDU frames are received.

Ports configured with the BPDU filter mode remain active (learning and forward frames). However, spanning tree cannot receive or transmit BPDUs on the port. The port remains in a forwarding state, permitting all broadcast traffic. This can create a network storm if there are any loops (that is, redundant links) using these ports. If you suddenly have a high load, disconnect the link and disable the BPDU filter (using the no command.)

The **no** form of the command sets the bpdu filter status to the default of disabled on the interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling the bpdu filter on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree bpdu-filter
```

Disabling bpdu filter on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree bpdu-filter
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree bpdu-guard

```
spanning-tree bpdu-guard
no spanning-tree bpdu-guard
```

Description

Enables the BPDU guard on the selected switch interface. When BPDU guard is enabled, interfaces receiving MSTP BPDUs become disabled.

BPDU protection is a security feature designed to protect the active MSTP topology by preventing spoofed BPDU packets from entering the MSTP domain. In a typical implementation, BPDU protection would be applied to edge ports connected to end user devices that do not run MSTP. If MSTP BPDU packets are received on a protected port, this feature disables that port and alerts the network manager using an SNMP trap.

Occasionally a hardware or software failure can cause MSTP to fail, creating forwarding loops that can cause network failures where unidirectional links are used. The non-designated port transitions in a faulty manner because the port is no longer receiving MSTP BPDUs.

The **no** form of the command disables BPDU guard on the selected interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling the BPDU guard on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree bpdu-guard
```

Disabling BPDU guard on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree bpdu-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree bpdu-guard timeout

```
spanning-tree bpdu-guard timeout <INTERVAL>
no spanning-tree bpdu-guard timeout [<INTERVAL>]
```

Description

Enables and configures the auto re-enable timeout in seconds for all interfaces with BPDU guard enabled. When an interface is disabled after receiving an unauthorized BPDU it will automatically be re-enabled after the timeout expires. The default is for the interface to stay disabled until manually re-enabled.

The **no** form of the command disables BPDU guard timeout on the interface. This is the default.

Parameter	Description
<INTERVAL>	Specifies the re-enable timeout in seconds. Range: 1 to 65535.

Example

On the 6400 Switch Series, interface identification differs.

Enabling the BPDU guard timeout on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree bpdu-guard timeout 10
```

Disabling BPDU guard timeout on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree bpdu-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree config-name

```
spanning-tree config-name <CONFIG-NAME>
no spanning-tree config-name [<CONFIG-NAME>]
```

Description

Sets the configuration name for the MST region in which the switch resides.

All switches within an MST region must have identical configuration names. For more than one MSTP switch in the same MST region, the identical region name must be configured on all such switches. If the default configuration name is retained on a switch, it cannot exist in the same MST region with another switch.

The **no** form of this command overwrites the currently configured name with the default name. The default name is a text string using the hexadecimal representation of the system MAC address.

Parameter	Description
<CONFIG-NAME>	Specifies the configuration name for the MST region in which the switch resides. Default: text string using the hexadecimal representation of the MAC address of the switch. Range: 1 - 32 nonblank characters (case-sensitive).

Examples

Setting the configuration name to MST0:

```
switch(config)# spanning-tree config-name MST0
```

Setting the configuration name to the default value:

```
switch(config)# no spanning-tree config-name
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree config-revision

```
spanning-tree config-revision <REVISION-NUMBER>
no spanning-tree config-revision [<REVISION-NUMBER>]
```

Description

Configures the revision number for the MST region in which the switch resides. All switches within an MST region must have identical revision numbers. Use this setting to differentiate between region configurations. For example, when changing configuration settings within a region where you want to track the configuration versions you use, or when creating a new region from a subset of switches in a current region and you want to maintain the same region name.

The **no** form of this command overwrites the currently configured revision number of the MST region and sets it to the default value of 0.

Parameter	Description
<REVISION-NUMBER>	Specifies the revision number for the MST region in which the switch resides.Range: 0 - 65535. Default: 0.

Examples

Setting the revision to 40:

```
switch(config)# spanning-tree config-revision 40
```

Setting the revision to the default value:

```
switch(config)# no spanning-tree config-revision
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree cost

```
spanning-tree cost <PORT-COST>
no spanning-tree cost [<PORT-COST>]
```

Description

Sets individual port cost for MSTI 0.

For a given port, the path cost setting can be different for different MSTIs to which the port may belong.

The switch uses the path cost to determine which ports are the forwarding ports in the MSTI; that is, which links to use for the active topology of the MSTI and which ports to block.

Cost gets calculated based on physical interface link speed. It is not based on cumulative speed of all physical links under a lag. Therefore, the cost will be same for a 1G interface and 2x1G lag interfaces.

The **no** form of the command sets the port cost for MSTI 0 instance to the default value.

Parameter	Description
<PORT-COST>	Specifies the cost of the port for MSTI 0. Range: 1-200,000,000. Default is calculated from the port link speed: ■ 10 Mbps link speed equals a path cost of 2,000,000. ■ 100 Mbps link speed equals a path cost of 200,000. ■ 1 Gbps link speed equals a path cost of 20,000. ■ 10 Gbps link speed equals a path cost of 2,000. ■ 100 Gbps link speed equals a path cost of 200. ■ 1 Tbps link speed equals a path cost of 20.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the cost to **2000** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree cost 2000
```

Setting the cost to the default on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree cost
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree forward-delay

```
spanning-tree forward-delay <DELAY-IN-SECS>
no spanning-tree forward-delay [<DELAY-IN-SECS>]
```

Description

Configures the time the switch waits between transitions from listening to learning and from learning to forwarding states.

The **no** form of this command sets forward delay time for the bridge to the default of 15 seconds.

Parameter	Description
<DELAY-IN-SECS>	Specifies the forward delay time in seconds. Default: 15 seconds. Range: 4-30.

Examples

Setting forward delay to 6 seconds:

```
switch(config)# spanning-tree forward-delay 6
```

Setting forward delay to the default of 15 seconds:

```
switch(config)# no spanning-tree forward-delay
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree hello-time

```
spanning-tree hello-time <HELLO-IN-SECS>
no spanning-tree hello-time [<HELLO-IN-SECS>]
```

Description

Configures the transmission interval between consecutive Bridge Protocol Data Units (BPDU) that the switch sends as a root bridge. The hello time interval is inserted in outbound BPDUs.

The **no** form of this command sets hello time to the default of 2 seconds.

Parameter	Description
<HELLO-IN-SECS>	Specifies the hello time interval in seconds. Default: 2 seconds. Range: 2-10.

Examples

Setting the hello time interval to 6 seconds:

```
switch(config)# spanning-tree hello-time 6
```

Setting the hello time interval to the default of 2 seconds:

```
switch(config)# no spanning-tree hello-time
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree instance cost

```
spanning-tree instance <INSTANCE-ID> cost <PORT-COST>
no spanning-tree instance <INSTANCE-ID> cost [<PORT-COST>]
```

Description

Sets the individual port cost for an MSTI. The switch uses the path cost to determine which links to use for the active topology of the MSTI (forwarding ports) and which ports to block. The path cost setting for a port can be different on each MSTI to which the port belongs.

The **no** form of this command sets the port cost for an MSTI to the default value.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTI number. Range: 1-64.
<PORT-COST>	Specifies the cost of the port for the MSTI. Range: 1-200000000. Default value is calculated from the port link speed: ▪ 10 Mbps link speed equals a path cost of 2000000. ▪ 100 Mbps link speed equals a path cost of 200000. ▪ 1 Gbps link speed equals a path cost of 20000.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the port **1/1/1** cost for MSTI **1** to **2000**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree instance 1 cost 2000
```

Setting the port **1/1/1** cost for MSTI **1** to the default:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree instance 1 cost
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree instance port-priority

```
spanning-tree instance <INSTANCE-ID> port-priority <PRIORITY-MULTIPLIER>
no spanning-tree instance <INSTANCE-ID> port-priority [<PRIORITY-MULTIPLIER>]
```

Description

Configures the priority as a priority multiplier for the specified ports in the specified MST instance.

For a given port, the priority setting can be different for different MST instances to which the port may belong.

The **no** form of this command sets the port priority to the default value of 8 for the MST instance. The default priority value is derived by multiplying 8 by 16.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTP instance number. Range: 1-64.
<PRIORITY-MULTIPLIER>	Specifies the priority as a multiplier. Default: 8. Range: 0 to 15. The priority range for a port in a given MST instance is 0 to 255. However, this command specifies the priority as a multiplier (0 to 15) of 16. When you specify a priority multiplier of 0 to 15, the actual priority assigned to the switch is: (priority-multiplier) x 16.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the port **1/1/1** priority for instance **1** to **8**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree instance 1 port-priority 8
```

Setting the port 1/1/1 priority for instance 1 to the default:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree instance 1 port-priority
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree instance priority

```
spanning-tree instance <INSTANCE-ID> priority <PRIORITY-MULTIPLIER>
no spanning-tree instance <INSTANCE-ID> priority [<PRIORITY-MULTIPLIER>]
```

Description

Sets the switch priority for the specified MST instance.

The **no** form of this command sets the priority for the specified instance to the default of 8.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTP instance number. Range: 1 to 64.
<PRIORITY-MULTIPLIER>	Specifies the priority as a multiplier. Default: 8. Range: 0 to 15. The priority range for an MSTP switch is 0-61440. However, this command specifies the priority as a multiplier (0 - 15) of 4096. That is, when you specify a priority multiplier value of 0 - 15, the actual priority assigned to the switch is: (priority-multiplier) x 4096. For example, with 2 as the priority-multiplier on a given MSTP switch, the switch priority setting is 8,192.

Examples

Setting the priority multiplier for instance 1 to 5:

```
switch(config)# spanning-tree instance 1 priority 5
```

Setting the priority multiplier for instance 1 to the default of 8:

```
switch(config)# no spanning-tree instance 1 priority
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree instance vlan

```
spanning-tree instance <INSTANCE-ID> vlan <VLAN-ID>
no spanning-tree instance <INSTANCE-ID> vlan <VLAN-ID>
```

Description

Creates a new instance with VLANs mapped or maps VLANs to an existing instance.

Each instance must have at least one VLAN mapped to it. When VLANs are mapped to an instance, they are automatically unmapped from the instance they were mapped to before. Any MSTP instance can have all the VLANs configured on the switch.

The **no** form of this command removes the specified VLAN from the MSTP instance.

Parameter	Description
<INSTANCE-ID>	Specifies the MSTP instance number. Range: 1 to 64.
<VLAN-ID>	Specifies a VLAN ID number.

Examples

Mapping VLAN 1 to instance 1:

```
switch(config)# spanning-tree instance 1 vlan 1
```

Removing VLAN 1 from instance 1:

```
switch(config)# no spanning-tree instance 1 vlan 1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree link-type

`spanning-tree link-type {point-to-point|shared}`

Description

Specifies the link type of the interface, which is normally derived from the duplex setting of the port. The default setting depends on the duplex mode of the port: full-duplex ports are point-to-point, half-duplex ports are shared.

Parameter	Description
`point-to-point`	Specifies the link type as point-to-point.
`shared`	Specifies the link type as shared.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the link type to point-to-point on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree link-type point-to-point
```

Setting the link type to shared on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree link-type shared
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree loop-guard

```
spanning-tree loop-guard
no spanning-tree loop-guard
```

Description

Enables the loop guard on the interface. STP loop guard is best applied on blocking or forwarding ports.

The **no** form of the command sets the loop guard status to the default of disabled on the interface.

Usage

Occasionally a hardware or software failure can cause MSTP to fail, creating forwarding loops that can cause network failures where unidirectional links are used. The non-designated port transitions in a faulty manner because the port is no longer receiving MSTP BPDUs.

Loop guard causes the non-designated port to go into the MSTP loop inconsistent state instead of the forwarding state. In the loop inconsistent state the port prevents data traffic and BPDU transmission through the link, therefore avoiding the loop creation. When BPDUs again are received on the inconsistent port, it resumes normal MSTP operation automatically.

In this example, the transmission from switch 1 port 10 to switch 2 port 20 is blocked due to a hardware failure. Switch 2 port 2 does not receive BPDUs and goes into a forwarding state, creating a loop.

When loop guard is configured for switch 2 port 20, this port goes from a forwarding state to an inconsistent state, and does not forward the traffic through the link, thus avoiding loop creation.

Examples

Enabling the loop guard on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree loop-guard
```

Disabling loop guard on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree loop-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree max-age

```
spanning-tree max-age <AGE-IN-SECS>
no spanning-tree max-age [<AGE-IN-SECS>]
```

Description

Sets the maximum age timer, which specifies the maximum age value that the switch inserts in outbound BPDU packets it sends as a root bridge. Max-age is the interval, specified in the BPDU, that BPDU data remains valid after its reception.

The bridge recomputes the spanning tree topology if it does not receive a new BPDU before max-age expiry.

The **no** form of this command sets the max-age value to the default of 20 seconds.

Parameter	Description
<AGE-IN-SECS>	Specifies the max-age in seconds. Range: 6 to 40. Default: 20.

Examples

Setting the max-age to 10 seconds:

```
switch(config)# spanning-tree max-age 10
```

Setting the max-age to the default of 20 seconds:

```
switch(config)# no spanning-tree max-age
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree max-hops

```
spanning-tree max-hops <HOP-COUNT>
no spanning-tree max-hops [<HOP-COUNT>]
```

Description

Configures the max hop setting that the switch inserts into BPDUs that it sends out as the root bridge. The max hop setting determines the number of bridges in an MST region that a BPDU can traverse before it is discarded.

The **no** form of this command sets the maximum number of hops to the default of 20.

Parameter	Description
<HOP-COUNT>	Specifies the maximum number of hops. Range: 1 to 40. Default: 20.

Examples

Setting the hop count to 10:

```
switch(config)# spanning-tree max-hops 10
```

Setting the max-age to the default of 20:

```
switch(config)# no spanning-tree max-hops
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree mode

```
spanning-tree mode {mstp|rpvst [auto-vlan-enable [priority <NUMBER>]]}
no spanning-tree mode {mstp|rpvst [auto-vlan-enable [priority <NUMBER>]]}
```

Description

Sets the spanning tree protocol (STP) mode to either MSTP mode (Multiple-instance Spanning Tree Protocol) or RPVST mode (Rapid Per VLAN Spanning Tree). Enabling the RPVST Auto VLAN feature will run RPVST on all VLANs currently configured on the switch. Default priority of 8 will be assigned to the VLANs being auto created.

The **no** form of this command sets the spanning tree mode to the default **mstp**.

Enabling auto-VLAN can lead to an undeterministic state if auto scaled beyond the max system limit mentioned in the capacity-status.

Parameter	Description
`mstp`	Sets the STP mode to MSTP which applies spanning tree separately for each set of VLANs called an MSTI (multiple spanning tree instance).
`rpvst`	Sets the STP mode to RPVST.
`auto-vlan-enable`	Selects RPVST auto VLAN mode.
`priority <NUMBER>`	Specifies the priorites for all auto created RPVST instances. Configured as a multiple of 4096. Default: 8.

Examples

Enabling MSTP mode:

```
switch(config)# spanning-tree mode mstp
```

Disabling MSTP mode:

```
switch(config)# no spanning-tree mode mstp
```

Enabling RPVST mode:

```
switch(config)# spanning-tree mode rpvst
```

Disabling RPVST mode:

```
switch(config)# no spanning-tree mode rpvst
```

Enabling RPVST auto VLAN with a priority of 1:

```
switch(config)# spanning-tree mode rpvst auto-vlan-enable priority 1
```

Disabling RPVST auto VLAN with a priority of 1:

```
switch(config)# no spanning-tree mode rpvst auto-vlan-enable priority 1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.12.1000	Auto VLAN enable added.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree port-priority

```
spanning-tree port-priority <PRIORITY-MULTIPLIER>
no spanning-tree port-priority [<PRIORITY-MULTIPLIER>]
```

Description

Configures the port priority. The priority of a port can be different for each MST instance to which it belongs.

The **no** form of the command sets the port priority for MST instance 0 to the default of 8. The default priority value is derived by multiplying 8 by 8. For LAG interfaces the default is 4.

Parameter	Description
<PRIORITY-MULTIPLIER>	Specifies the port priority as a multiplier. Default: 8, except for LAG interfaces where the default is 4. Range: 0 to15. The priority range for a port in a given MSTI is 0 to 255. However, this command specifies the priority as a multiplier (0 to 15) of 16. When you specify a priority multiplier of 0 to15, the actual priority assigned to the switch is: (priority-multiplier) x 16.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the port priority to 8 on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree port-priority 8
```

Setting the port priority to the default on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree port-priority
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree port-type

```
spanning-tree port-type {admin-edge|admin-network}
no spanning-tree port-type [admin-edge|admin-network]
```

Description

Sets the STP port type for the interface.

Port types include: admin-edge and admin-network.

The **no** form of the command sets the port type to the default of admin-network.

Parameter	Description
`admin-edge`	Specifies the port type as administrative edge. During spanning tree establishment, ports with admin-edge enabled transition immediately to the forwarding state.
`admin-network`	Specifies the port type as administrative network. When this option is selected, the port looks for BPDUs for the first 3 seconds. If there are none, the port is classified as an edge port and immediately starts forwarding packets. If BPDUs are seen on the port, the port is classified as a non-edge port and normal STP operation commences on that port.

Examples

On the 6400 Switch Series, interface identification differs.

Setting the port type to admin-edge on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree port-type admin-edge
```

Setting the port type to admin-network on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree port-type admin-network
```

Setting the port type to the default of admin-network on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree port-type
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree priority

```
spanning-tree priority <PRIORITY-MULTIPLIER>
no spanning-tree priority [<PRIORITY-MULTIPLIER>]
```

Description

Configures the switch (bridge) priority for the designated region in which the switch resides.

The switch compares this priority with the priorities of other switches in the same region to determine the root switch for the region. The lower the priority value, the higher the priority.

The **no** form of this command sets the bridge priority to the default of 8. The default priority value is derived by multiplying 8 by 4096.

Parameter	Description
<PRIORITY-MULTIPLIER>	Specifies the priority as a multiplier. Range: 0 to 15. Default: 8.

Parameter	Description
	The priority range for an MSTP switch is 0-61440. However, this command specifies the priority as a multiplier (0 to 15) of 4096. That is, when you specify a priority multiplier value of 0 to 15, the actual priority assigned to the switch is: (priority-multiplier) x 4096. For example, with 2 as the priority-multiplier on a given MSTP switch, the switch priority setting is 8,192.

Usage

Every switch running an instance of MSTP has a Bridge Identifier, which is a unique identifier that helps distinguish this switch from all others. The switch with the lowest Bridge Identifier is elected as the root for the tree. The Bridge Identifier is composed of a configurable priority component (2 bytes) and the bridge's MAC address (6 bytes). You can change the priority component provides flexibility in determining which switch will be the root for the tree, regardless of its MAC address.

Examples

Setting the priority multiplier to 12:

```
switch(config)# spanning-tree priority 12
```

Setting the priority multiplier to the default of 8:

```
switch(config)# no spanning-tree priority
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree root-guard

```
spanning-tree root-guard
no spanning-tree root-guard
```

Description

Enables the root guard on the interface.

When a port is enabled as root-guard, it cannot be selected as the root port even if it receives superior STP BPDUs. The port is assigned an "alternate" port role and enters a blocking state if it receives superior MSTP BPDUs.

A superior BPDU contains both "better" information on the root bridge and path cost to the root bridge, which would normally replace the current root bridge selection.

The **no** form of the command sets the root guard status to the default of disabled on the interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling the root guard on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree root-guard
```

Disabling root guard on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree root-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree rpvst-filter

```
spanning-tree rpvst-filter
no spanning-tree rpvst-filter
```

Description

Enables the RPVST filter for the interface. This command is only applicable to MSTP mode. It is not applicable to RPVST+ mode.

When the RPVST filter is enabled, the ingressing RPVST proprietary BPDUs are dropped after copying to CPU whereas the standard IEEE RPVST BPDUs are still allowed. This helps in preventing the flooding of RPVST proprietary BPDUs under an MSTP-RPVST interop environment.

If the neighboring switch is running RPVST then this pair of switches will not converge as RPVST BPDUs will not reach them.

If enabling RPVST filter causes a high traffic load, shutdown the port and reconfigure the BPDU filter with the CLI command: **no spanning tree rpvst-filter**.

RPVST filter is disabled by default.

Example

On the 6400 Switch Series, interface identification differs.

Enabling the RPVST filter on interface 1/1/1:

```
switch# configure terminal
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree rpvst-filter
```

Disabling RPVST filter on interface 1/1/1:

```
switch# configure terminal
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree rpvst-filter
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree rpvst-guard

```
spanning-tree rpvst-guard
no spanning-tree rpvst-guard
```

Description

Enables RPVST guard on the switch interface. This command is only applicable to MSTP mode. It is not applicable to RPVST+ mode.

When RPVST guard is enabled on an interface, it will disable that interface if RPVST BPDUs are received on it.

The **no** form of the command sets the RPVST guard status to the default of disabled on the interface.

Example

On the 6400 Switch Series, interface identification differs.

Enabling RPVST guard on interface 1/1/1:

```
switch# configure terminal
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree rpvst-guard
```

Disabling RPVST guard on interface 1/1/1:

```
switch# configure terminal
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree rpvst-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree tcn-guard

```
spanning-tree tcn-guard
no spanning-tree tcn-guard
```

Description

Enables the TCN (Topology Change Notification) guard in the interface. When enabled for a port, the port stops propagating received topology change notifications and topology changes to other ports.

The **no** form of the command sets the TCN guard status to the default of disabled on the interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling TCN guard on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree tcn-guard
```

Disabling TCN guard on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree tcn-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

spanning-tree transmit-hold-count

```
spanning-tree transmit-hold-count <COUNT>
no spanning-tree transmit-hold-count [<COUNT>]
```

Description

Sets the maximum number of BPDUs per second that the switch can send from an interface.

The **no** form of this command sets the transmit-hold-count to the default of 6.

Parameter	Description
<COUNT>	Specifies the number of BPDUs that can be sent per second. Range: 1 to 10. Default: 6.

Examples

Setting the transmit-hold-count to 5:

```
switch(config)# spanning-tree transmit-hold-count 5
```

Setting the transmit-hold-count to the default of 6:

```
switch(config)# no spanning-tree transmit-hold-count
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

spanning-tree trap

```
spanning-tree trap {new-root|topology-change [instance <INSTANCE-ID>] |
       errant-bpdu | root-guard-inconsistency | loop-guard-inconsistency}
no spanning-tree trap {new-root|topology-change [instance <INSTANCE-ID>] |
       errant-bpdu | root-guard-inconsistency | loop-guard-inconsistency}
```

Description

Enables SNMP traps for new root, topology change event, errant-bpdu received event, root-guard inconsistency, and loop-guard inconsistency notifications. It is disabled by default.

The **no** form of this command disables the notifications for SNMP traps.

Parameter	Description
`new-root`	Enabling SNMP notification when a new root is elected on any MST instance on the switch.
`topology-change`	Enabling SNMP notification when a topology change event occurs in the specified MST instance on the switch.
`<INSTANCE-ID>`	Specifies the instance ID for the topology change trap. Range: 0 to 64.
`errant-bpdu`	Enabling SNMP notification when an errant bpdu is received by any MST instance on the switch.
`root-guard-inconsistency`	Enabling SNMP notification when the root-guard finds the port inconsistent for any MST instance on the switch.
`loop-guard-inconsistency`	Enabling SNMP notification when the loop-guard finds the port inconsistent for any MST instance on the switch.

Examples

Enabling the notifications for the SNMP traps:

```
switch(config)# spanning-tree trap
  new-root                  Enable notifications which are sent when a new root is
elected
  topology-change           Enable notifications which are sent when a topology
change occurs
  errant-bpdu               Enable notifications which are sent when an errant
bpdu is received
  root-guard-inconsistency  Enable notifications which are sent when root guard
inconsistency occurs
  loop-guard-inconsistency  Enable notifications which are sent when loop guard
inconsistency occurs
switch(config)# spanning-tree trap new-root
  <cr>
switch(config)# spanning-tree trap topology-change
  instance  Enable topology change notification for the specified MST instance id.
switch(config)# spanning-tree trap topology-change instance
  <0-64>  Enable topology change information on the specified instance id.
switch(config)# spanning-tree trap topology-change instance 1
  <cr>
switch(config)# spanning-tree trap errant-bpdu
  <cr>
switch(config)# spanning-tree trap root-guard-inconsistency
  <cr>
switch(config)# spanning-tree trap loop-guard-inconsistency
  <cr>
```

Disabling the notifications for the SNMP traps:

```
switch(config)# no spanning-tree trap
  new-root                  Disable notifications which are sent when a new root
is elected
  topology-change           Disable notifications which are sent when a topology
change occurs
  errant-bpdu               Disable notifications which are sent when an errant
bpdu is received
  root-guard-inconsistency  Disable notifications which are sent when root guard
inconsistency occurs
  loop-guard-inconsistency  Disable notifications which are sent when loop guard
inconsistency occurs
switch(config)# no spanning-tree trap new-root
  <cr>
switch(config)# no spanning-tree trap topology-change
  instance  Disable topology change notification for the specified MST instance
switch(config)# no spanning-tree trap topology-change instance
  <0-64>  Disable topology change information on the specified instance id
switch(config)# no spanning-tree trap topology-change instance 1
  <cr>
switch(config)# no spanning-tree trap errant-bpdu
  <cr>
switch(config)# no spanning-tree trap root-guard-inconsistency
  <cr>
switch(config)# no spanning-tree trap loop-guard-inconsistency
  <cr>
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

Chapter 89

Multicast VXLAN commands

clear ip mroute

```
clear ip mroute
   all-vrfs
   group-prefix <group-prefix>
   <group-address>[<source-address>]
   <port>
   vrf <vrf-name>
```

Description

Clears the multicast routing information for a specified VRF or all VRFs. If you do not include VRF information in these commands, the **clear ip mroute** commands clear the **default** VRF.

Parameter	Description
`all-vrfs`	Clears multicast routing for all VRFs.
`<group-address>`	Clears the multicast routing information for the group address in the specified VRF or all VRFs. If the command does not include VRF information, it clears routing information for the group address in the **default** VRF.
`<source-address>`	Clears multicast routing information for the group and source addresses in the specified VRF or all VRFs. If the command does not include VRF information, it clears routing information for the group and source addresses in the **default** VRF.
`group-prefix <group-prefix>`	Clears the multicast routing information for the group prefix in the specified VRF or all VRFs. The group prefix must be in the format **A.B.C.D/length**. If the command does not include VRF information, it clears routing information for the group address in the **default** VRF.
`<port>`	Clears the multicast routing information for the port in the specified VRF or all VRFs. If the command does not include VRF information, it clears routing information for the port in the **default** VRF.
vrf *<VRF-NAME>*	Clears multicast routing information for a specific VRF.

Examples

Clears multicast routing information for the default VRF.

```
switch# clear ip mroute
```

Clears multicast routing information the group address **225.1.1.1** for the VRF **Lab2**.

```
switch# clear ip mroute 225.1.1.1 vrf Lab2
```

Clears multicast routing information the group address **225.1.1.1** and source address 192.0.2.6 for all VRFs

```
switch# clear ip mroute 225.1.1.1 192.0.2.6 all-vrfs
```

Clears multicast routing information for the port **VLAN10** on the **Default** VRF.

```
clear ip mroute vlan10
```

Clears multicast routing information for the port **VLAN10** for the group address **225.1.1.1** and source address **192.0.2.6** for the VRF **Lab3**.

```
switch# clear ip mroute vlan20 225.1.1.1 192.0.2.6 Lab3
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip pim-sparse datapath-auto-include

```
ip pim-sparse datapath-auto-include
no ip pim-sparse datapath-auto-include
```

Description

Enables the router to forward multicast data received on the VXLAN L3VNI fabric to this interface, regardless of whether a multicast join was received on this interface or not. This allows the interface to be in the same multicast data path state on both the VSX peers.

This command must be enabled on the VSX VXLAN routers to support multicast receivers over ROP or P2P SVI extensions. This command can be enabled on a transit L3 peering between VSX peers. This command is optional when the uplink is an MCLAG SVI.

The **no** form of the command disables forwarding of multicast data on the interface.

- An IP address must be configured on the interface and `pim-sparse` must be enabled.
- This command must be enabled only on one interface per VRF.

PIM enabled VXLAN VTEPs can be extended to other routers that can be connected to sources or clients. The following types of L3 or L2 extensions are supported:

- L2 VSX LAG: Upstream or downstream routers are connected using L2 VSX LAG links.
- L3 VSX LAG: Upstream or downstream routers are connected using L3 VSX LAG links.
- ROP extension: L3 extension for sources or clients using ROPs is supported.
- Point-to-point SVI extension: L3 extension for sources or clients using point-to-point SVIs is supported.

If the source is connected using ROP or P2P SVIs, it is recommended to have an additional L3 link per VRF between the VSX devices for upstream redundancy. If the L3 link is an SVI, it is recommended to not add an ISL port in that VLAN.

Parameter	Description
`datapath-auto-include`	Includes the interface for multicast data forwarding.

Examples

Configuring interface 40.0.0.4/24 of the router to forward multicast data:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip address 40.0.0.4/24
switch(config-if-vlan)# ip pim-sparse enable
switch(config-if-vlan)# ip pim-sparse datapath-auto-include
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip pim-sparse vsx-virtual-neighbor

`ip pim-sparse vsx-virtual-neighbor`

```
no ip pim-sparse vsx-virtual-neighbor
```

Description

Once configured, the router processes IGMP/MLD and PIM joins received on this interface regardless of its DR or Prime Neighbor role. The command must be enabled for VSX VXLAN leaf switches for both L2 and L3 extensions. This allows for the interface to be in the same multicast data path state on both the VSX peers.

The **no** form of the command disables the vsx-virtual-neighbor on the interface.

This command is applicable for normal SVI interfaces and L2 VNI mapped SVI interfaces. It is valid for VXLAN-enabled VLANs only and has no effect on non-VXLAN-enabled VLANs.

Examples

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip address 40.0.0.4/24
switch(config-if-vlan)# ip pim-sparse enable
switch(config-if-vlan)# ip pim-sparse vsx-virtual-neighbor
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse datapath-auto-include

```
ipv6 pim6-sparse datapath-auto-include
no ipv6 pim6-sparse datapath-auto-include
```

Description

Enables the router to forward multicast data received on the VXLAN L3VNI fabric to this interface, regardless of whether a multicast join was received on this interface or not. This allows the interface to be in the same multicast data path state on both the VSX peers.

This command must be enabled on the VSX VXLAN routers to support multicast receivers over ROP or P2P SVI extensions. This command can be enabled on a transit L3 peering between VSX peers. This command should not be enabled when the uplink is an MCLAG SVI.

The **no** form of the command disables forwarding of multicast data on the interface.

- An IP address must be configured on the interface and `pim-sparse` must be enabled.
- This command must be enabled only on one interface per VRF.

PIM enabled VXLAN VTEPs can be extended to other routers that can be connected to sources or clients. The following types of L3 or L2 extensions are supported:

- L2 VSX LAG: Upstream or downstream routers are connected using L2 VSX LAG links.
- L3 VSX LAG: Upstream or downstream routers are connected using L3 VSX LAG links.
- ROP extension: L3 extension for sources or clients using ROPs is supported.
- Point-to-point SVI extension: L3 extension for sources or clients using point-to-point SVIs is supported.

If the source is connected using ROP or P2P SVIs, it is recommended to have an additional L3 link per VRF between the VSX devices for upstream redundancy. If the L3 link is an SVI, it is recommended to not add an ISL port in that VLAN.

Parameter	Description
`datapath-auto-include`	Includes the interface for multicast data forwarding.

Examples

Configuring interface 40.0.0.4/24 of the router to forward multicast data:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 address 40:40::4/64
switch(config-if-vlan)# ipv6 pim6-sparse enable
switch(config-if-vlan)# ipv6 pim6-sparse datapath-auto-include
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse vsx-virtual-neighbor

`ipv6 pim6-sparse vsx-virtual-neighbor`

```
no ipv6 pim6-sparse vsx-virtual-neighbor
```

Description

Once configured, the router processes IGMP/MLD and PIM joins received on this interface regardless of its DR or Prime Neighbor role. The command must be enabled for VSX VXLAN leaf switches for both L2 and L3 extensions. This allows for the interface to be in the same multicast data path state on both the VSX peers.

The **no** form of the command disables the vsx-virtual-neighbor on the interface.

This command is applicable for normal SVI interfaces and L2 VNI mapped SVI interfaces. It is valid for VXLAN-enabled VLANs only and has no effect on non-VXLAN-enabled VLANs.

Examples

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 address 40:40::4/64
switch(config-if-vlan)# ipv6 pim6-sparse enable
switch(config-if-vlan)# ipv6 pim6-sparse vsx-virtual-neighbor
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

register-source

```
register-source <INTERFACE-NAME>
no register-source <INTERFACE-NAME>
```

Description

Specifies the source interface to be used for PIM registration in the case of VXLAN anycast interfaces. When the PIM enabled anycast VLAN is directly connected to a multicast source, **register-source** is used to send registration messages to the RP and this interface receives the register-stop messages from the RP.

The **no** form of this command removes the register source configuration.

Parameter	Description
<INTERFACE-NAME>	Specifies the name of the interface to use.

Usage

- This is a global configuration under router-pim configuration and is required in Symmetric IRB with anycast IP address configuration.
- This configuration is required in the source connected switch only when the PIM-DR and RP are in two different switches.
- Without this configuration, there will be traffic loss as the registration sequence will not be successful. It is mandatory to have this source interface configured with a non-anycast IP address which is unique to the VTEP, and with PIM enabled.

Examples

Configuring the source interface for PIM registrations:

```
switch# config
switch(config)# router pim vrf vrf1
switch(config-pim)# register-source loopback1
```

Removing the **register-source** configuration:

```
switch(config-pim)# no register-source loopback1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

show ip mroute

```
show ip mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows all PIM neighbors information.
`vrf <VRF-NAME>`	Shows PIM neighbor information for a specific VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Multicast route with L3VNI in Incoming Interface List:

```
switch# show ip mroute all-vrfs
IP Multicast Route Entries

VRF : red
Total number of entries : 1

Group Address            : 225.1.1.1
Source Address           : 80.1.1.11
Neighbor                 : 1.1.1.1
Incoming interface       : vni2
Outgoing Interface List :
Interface       State
-----------     ----------
vlan10          forwarding

switch# show ip mroute 225.1.1.1 80.1.1.11 all-vrfs

IP Multicast Route Entries

VRF : red

Group Address                  : 225.1.1.1
Source Address                 : 80.1.1.11
Neighbor                       : 1.1.1.1
Incoming interface             : vni2
Multicast Routing Protocol     : PIM-SM
Unicast Routing Protocol       : BGP
Metric                         : 0
Metric  Pref                   : 200
Uptime (HH:MM:SS)              : 00:07:23
Downstream Interface
Interface       State
-----------     ----------
vni2            forwarding
vni2            forwarding
```

Multicast route with L3VNI in Outgoing Interface List:

```
switch# show ip mroute all-vrfs
IP Multicast Route Entries

VRF : red
Total number of entries : 1
```

```
Group Address           : 225.1.1.1
Source Address          : 80.1.1.11
Neighbor                :
Incoming interface      : vlan20
Outgoing Interface List :
Interface       State
-----------     ----------
vni2               forwarding

switch# show ip mroute 225.1.1.1 80.1.1.11 vrf red

IP Multicast Route Entries

VRF : red
Total number of entries : 1

Group Address                 : 225.1.1.1
Source Address                : 80.1.1.11
Neighbor                      :
Incoming interface            : vlan20
Multicast Routing Protocol    : PIM-SM
Unicast Routing Protocol      : connected
Metric                        : 0
Metric  Pref                  : 0
Uptime (HH:MM:SS)             : 00:06:32
Downstream Interface
Interface       State
-----------     ----------
vni2               forwarding
```

Detailed multicast route that displays the individual VTEPs to which the packet is forwarded:

```
switch# show ip mroute 239.2.2.2 100.2.1.4 vrf red detail

VRF : red

Group Address           : 239.2.2.2
Source Address          : 100.2.1.4
SSM Mroute              : False
Neighbor                : 20.20.20.2
Incoming interface      : 1/1/2
Unicast Routing Protocol: OSPF
Metric                  : 200
Metric Pref             : 110
Downstream Interface
Interface      State          Proxy-DR     VTEPS
-----------    ----------     --------     -------
vni1000        forwarding     false        3.3.3.3
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim neighbor

```
show ip pim neighbor [<IP-ADDR>] [all-vrfs | vrf <VRF-NAME>]
show ip pim neighbor [<BRIEF>] [all-vrfs | vrf <VRF-NAME>]
```

Description

Displays the information about PIM interfaces currently configured in the router for the given VRF. If VRF is not given, it displays for default VRF.

Parameter	Description
<IP-ADDR>	Shows PIM neighbor information.
<BRIEF>	Shows brief PIM neighbor information.
`all-vrfs`	Shows all PIM neighbors information
`vrf` *<VRF-NAME>*	Shows PIM neighbor information for a specific VRF.

Examples

Show information for all VRFs:

```
switch# show ip pim neighbor all-vrfs

PIM Neighbor

VRF                          : Test_1
Total number of neighbors : 2

IP Address                   : 100.1.1.252
Interface                    : vlan100
Up Time (HH:MM:SS)           : 00:44:38
Expire Time (HH:MM:SS)       : 00:01:32
DR Priority                  : 1
Hold Time (HH:MM:SS)         : 00:01:45

IP Address                   : 172.1.1.1
Interface                    : vni1000
Up Time (HH:MM:SS)           : 00:44:35
Expire Time (HH:MM:SS)       : 00:03:25
DR Priority                  : 1
Hold Time (HH:MM:SS)         : 00:03:30
```

PIM supports both IPv4 and IPv6 as underlay VTEP IP addresses. In deployments with an IPv6 underlay, PIM forms an auto-generated link-local address to exchange control packets and forms a PIM neighborship over an L3VNI interface with other VTEPs. The auto generated IP will be a link local IP in case of overlay IPv6.

The following example displays L3VNI neighbors for an IPv6 underlay tunnel with an IPv4 overlay.

```
switch# show ip pim neighbor all-vrfs
PIM Neighbor
VRF                        : Test_1
Total number of neighbors : 1
IP Address                 : 169.254.125.33
Interface                  : vni1000
Up Time (HH:MM:SS)         : 00:44:35
Expire Time (HH:MM:SS)     : 00:03:25
DR Priority                : 1
Hold Time (HH:MM:SS)       : 00:03:30
```

In deployments with an IPv4 overlay, multicast route entries with an incoming L3VNI interface will have a neighbor ip address that is an auto-generated IPv4 address derived from the underlay V6 tunnel address,

```
switch# show ip mroute 230.1.1.1 vrf Test_1 detail
IP Multicast Route Entries
VRF : Test_1
Total number of entries : 1
Group Address                 : 230.1.1.1
Source Address                : 40.40.1.100
Neighbor                      : 169.254.125.33
Incoming interface            : vni1000
Unicast Routing Protocol      : BGP
Metric                        : 0
Metric  Pref                  : 200
Uptime (HH:MM:SS)             : 00:01:45
Downstream Interface
Interface       State
-----------     ----------
vlan20          forwarding
```

Show **brief** information for PIM neighbor:

```
switch# show ip pim neighbor brief

----------------------------------------------------------------------------------
---------
        VRF: default                 Total number of neighbor : 2
----------------------------------------------------------------------------------
---------
Interface     Neighbor    Uptime       Expires       DR       Hold Time
Secondary Address             (IPV4)     (HH:MM:SS)   (HH:MM:SS)   Priority  (HH:MM:SS)
  (IPV4)
-----------   ----------  ----------   ----------   -------   ----------  --------
---------
1/1/1         40.0.0.5     11:54:21    00:01:31    1000      00:01:45   Nil
1/1/2         50.0.0.5     00:03:23    00:01:23    500       00:01:45   60.0.0.4 ,
70.0.0.4
----------------------------------------------------------------------------------
---------
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 mroute

```
show ipv6 mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows all PIM neighbors information.
`vrf <VRF-NAME>`	Shows PIM neighbor information for a specific VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing multicast route with L3VNI in Incoming Interface List:

```
switch# show ipv6 mroute all-vrfs
IP Multicast Route Entries

VRF : red
Total number of entries : 1

Group Address            : ff55::100:1
Source Address           : 200:200::100
SSM Mroute               : False
Neighbor                 : fe80::5:5:5:5
Uptime                   : 00:02:37
State                    : route
Incoming interface       : vni2
Outgoing Interface List :
Interface       State
-----------     ----------
vlan10          forwarding
```

```
switch# show ipv6 mroute ff55::100:1 200:200::100 vrf red

IP Multicast Route Entries

VRF : red

Group Address                 : ff55::100:1
Source Address                : 200:200::100
Neighbor                      :
Incoming interface            : vni2
Multicast Routing Protocol    : PIM-SM
Unicast Routing Protocol      : BGP
Metric                        : 0
Metric  Pref                  : 200
Uptime (HH:MM:SS)             : 00:10:24
```

Showing multicast route with L3VNI in Outgoing Interface List:

```
switch# show ipv6 mroute all-vrfs
IP Multicast Route Entries

VRF : red
Total number of entries : 1

Group Address           : ff55::100:1
Source Address          : 200:200::100
Neighbor                :
Uptime                  : 00:06:38
State                   : route
Incoming interface      : vlan20
Outgoing Interface List :
Interface       State
-----------     ----------
vni2            forwarding
```

```
switch# show ipv6 mroute ff55::100:1 200:200::100 vrf red
IP Multicast Route Entries

VRF : red
Total number of entries : 1

Group Address                 : ff55::100:1
Source Address                : 200:200::100
Neighbor                      :
Incoming interface            : vlan20
Multicast Routing Protocol    : PIM-SM
Unicast Routing Protocol      : connected
Metric                        : 0
Metric  Pref                  : 0
Uptime (HH:MM:SS)             : 00:06:38
Downstream Interface
Interface       State
-----------     ----------
vni2            forwarding
```

Showing detailed multicast route that displays the individual VTEPs to which the packet is forwarded:

```
switch# show ipv6 mroute all-vrfs ff55::100:1 200:200::100 vrf red detail

VRF : red
Total number of entries : 1

Group Address            : ff55::100:1
Source Address           : 200:200::100
SSM Mroute               : False
Neighbor                 :
Incoming Interface       : vlan20
Unicast Routing Protocol: connected
Metric                   : 0
Metric Pref              : 0
Downstream Interface
Interface      State        Proxy-DR    VTEPs
-----------   ----------    ---------   ---------
vni2          forwarding    false       3.3.3.3
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 interface vlan

```
show ipv6 pim6 interface vlan <vlan name>
```

Description

Displays the IPV6 information about PIM6 interfaces currently configured in the router for the given VLAN. If VLAN is not given, it displays for default VLAN.

Parameter	Description
`vlan <vlan name>`	Specifies the vlan.

Examples

Showing the IPV6 information about PIM6 interfaces currently configured in the router for VLAN 301:

```
switch(config)# show ipv6 pim6 interface vlan301
Interface                     : vlan301
Neighbor count                : 1
IPv6 Address                  : fe80::5480:2881:2dfc:b200/64
Mode                          : sparse
Designated Router             : fe80::5480:2881:2dfc:b200
Proxy DR                      : false
Hello Interval (sec)          : 30
Hello Delay (sec)             : 5
Override Interval (msec)      : 2500            Lan Prune Delay     : Yes
Propagation Delay (msec)      : 500             Configured DR Priority    : 100
Operational DR Priority       : 100
Neighbor Timeout              : 82
VSX Virtual Neighbor          : true
Datapath Auto Include         : true
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

```
switch (config-if-vlan)# show traffic-insight test monitor-type dns-average-
latency
                           mon2 error-statistics

Type                                   : dns-average-latency
Start time for error monitoring        : 10/10/2022 04:12:13.923691 UTC
End time for error monitoring          : 10/10/2022 04:17:13.964505 UTC

client_mac         dns_server_ip     number_of_  dns_name    dns_server  dns_format
                                  dns_failures  _errors     _failures     _errors
----------------------------------------------------------------------------------
--
aa:aa:aa:aa:aa:aa   172.0.0.1           200        50          100          50
bb:bb:bb:bb:bb:bb   172.1.1.1           50         10          20           20
cc:cc:cc:cc:cc:cc   172.2.2.2           150        75          25           50
```

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

show ipv6 pim6 neighbor

`show ipv6 pim6 neighbor [<IP-ADDR>] [all-vrfs | vrf <VRF-NAME>]`

Description

Displays the information about PIM interfaces currently configured in the router for the given VRF. If VRF is not given, it displays for default VRF.

The overlay IPv6 address of the LRVNI is an autogenerated link local IP that is derived by PIM using the VXLAN source IP.

Parameter	Description
<IP-ADDR>	Shows PIM neighbor information.
`all-vrfs`	Shows all PIM neighbors information
`vrf` *<VRF-NAME>*	Shows PIM neighbor information for a specific VRF.

Examples

Show information for all VRFs:

```
switch# show ipv6 pim6 neighbor all-vrfs

PIM Neighbor

VRF                        : red
Total number of neighbors  : 2

IPv6 Address               : fe80::5:5:5:5
Interface                  : vni10000
Up Time (HH:MM:SS)         : 06:57:307
Expire Time (HH:MM:SS)     : 00:03:26
DR Priority                : 1
Hold Time (HH:MM:SS)       : 00:03:30

IPv6 Address               : fe80::3281:c780:a5c:18c0
Interface                  : vlan10
Up Time (HH:MM:SS)         : 00:01:46
Expire Time (HH:MM:SS)     : 00:01:29
DR Priority                : 1
Hold Time (HH:MM:SS)       : 00:01:45
Secondary IP Addresses     : 100:100::3
```

PIM supports both IPv4 and IPv6 as underlay VTEP IP addresses. If the outgoing interface is a L3VNI, the forwarded VTEP IP address will be displayed as the actual IPv6 underlay tunnel source IP address.

```
switch# show ipv6 mroute 230.1.1.1 vrf Test_1 detail
IP Multicast Route Entries
VRF : Test_1
Total number of entries : 1
Group Address                    : 230.1.1.1
Source Address                   : 40.40.1.100
Neighbor                         : 100.100.1.1
Incoming interface               : 1/1/6
Multicast Routing Protocol       : PIM-SM
Unicast Routing Protocol         : BGP
Metric                           : 0
Metric  Pref                     : 20
Uptime (HH:MM:SS)                : 00:02:06
Downstream Interface
```

```
Interface        State          Vteps
-----------      ----------     -----
vni1000          forwarding     5::5
```

The following example displays L3VNI neighbors for an underlay IPv6 tunnel with an IPv6 overlay

```
switch# show ipv6 pim6 neighbor all-vrfs
PIM Neighbor
VRF                        : Test_1
Total number of neighbors : 1
IP Address                 : fe80::165:72:119
Interface                  : vni1000
Up Time (HH:MM:SS)         : 00:40:38
Expire Time (HH:MM:SS)     : 00:01:32
DR Priority                : 1
Hold Time (HH:MM:SS)       : 00:01:45
```

In deployments with an IPv6 overlay, multicast route entries with an incoming L3VNI interface will have a neighbor IP that is an auto-generated IPv6 address derived from the IPv6 underlay tunnel. This example displays multicast routes for an IPv6 underlay tunnel with an IPV6 overlay.

```
switch# show ipv6 mroute ff55::1 vrf Test_1 detail
IP Multicast Route Entries
VRF : Test_1
Total number of entries : 1
Group Address                   : ff55::1
Source Address                  : 40:40::100
Neighbor                        : fe80::165:72:119
Incoming interface              : vni1000
Unicast Routing Protocol        : BGP
Metric                          : 0
Metric  Pref                    : 200
Uptime (HH:MM:SS)               : 00:01:45
Downstream Interface
Interface        State
-----------      ----------
vlan20           forwarding
```

If the outgoing interface is L3VNI, the forwarded VTEP IP address will be displayed as the actual underlay IPv6 tunnel source IP.

```
switch# show ipv6 mroute ff55::1 vrf Test_1 detail
IP Multicast Route Entries
VRF : Test_1
Total number of entries : 1
Source Address                  : 40:40::100
Neighbor                        : fe80::f860:f001:4057:6900
Incoming interface              : 1/1/6
Multicast Routing Protocol      : PIM-SM
Unicast Routing Protocol        : BGP
Metric                          : 0
Metric  Pref                    : 20
Uptime (HH:MM:SS)               : 00:02:06
Downstream Interface
Interface        State          Vteps
-----------      ----------     -----
```

```
vni1000         forwarding     5::5
Group Address                 : ff55::1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Multicast VXLAN Multi-fabric commands

For a complete list of Multicast VXLAN commands, refer to Multicast VXLAN commands.

show ip mroute detail

```
show ip mroute <GROUP ADDRESS> <SOURCE ADDRESS> [all-vrfs | vrf <VRF-NAME>] detail
```

Description

Shows multicast routing information from a border router where traffic from a local site is forwarded to a remote site. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows all PIM neighbors information.
`vrf <VRF-NAME>`	Shows PIM neighbor information for a specific VRF.

Usage

The Intra-Inter Forwarded VTEP(s) tunnel field denotes which tunnel the traffic is routed to. This includes the intra or inter VTEPs based on where the joins are seen. If there is more than one site where the traffic needs to be forwarded, the corresponding site's VTEPs are listed. The Intra-Inter Forwarded VTEP(s) field is only visible at the Border router.

There are no outgoing interfaces listed in these Mroutes as they are routing withing the same L3VNI logical interface. If there are any local receivers at the border routers that are extended via L2/L3 extensions, then the same Mroute is updated with the outgoing list.

Examples

Multicast route where the border is routing from one VTEP to another VTEP. In this case, VTEP 1.1.1.1 to 3.3.3.3 in L3VNI:

```
switch# show ip mroute 225.0.0.1 100.100.1.4 all-vrfs detail
IP Multicast Route Entries

VRF : red

Group Address                  : 225.0.0.1
Source Address                 : 100.100.1.4
Neighbor                       : 1.1.1.1
Incoming interface             : vni10000
Intra-Inter Forwarded VTEP(s) : 3.3.3.3
Multicast Routing Protocol     : PIM-SM
Unicast Routing Protocol       : BGP
Metric                         : 0
Metric Pref                    : 200
Uptime (HH:MM:SS)              : 00:00:51
```

Multicast route where the border is routing from one VTEP to another VTEP in addition to an L3 interface:

```
switch# show ip mroute 225.0.0.1 100.100.1.4 all-vrfs detail
IP Multicast Route Entries

VRF : red

Group Address                  : 225.0.0.1
Source Address                 : 100.100.1.4
Neighbor                       : 1.1.1.1
Incoming interface             : vni10000
Intra-Inter Forwarded VTEP(s) : 3.3.3.3
Multicast Routing Protocol     : PIM-SM
Unicast Routing Protocol       : BGP
Metric                         : 0
Metric Pref                    : 200
Uptime (HH:MM:SS)              : 00:00:51


Outgoing Interface List
Interface       State
----------------------------
vlan1675        forwarding
```

Multicast route where the output is at the source connected leaf router. In this case, traffic ingresses on SVI10 and is routed to VTEP 2.2.2.2:

```
switch# show ip mroute 225.0.0.1 100.100.1.4 all-vrfs detail
IP Multicast Route Entries

VRF : red

Group Address                  : 225.0.0.1
Source Address                 : 100.100.1.4
Neighbor                       :
Incoming interface             : vlan10
Multicast Routing Protocol     : PIM-SM
```

```
Unicast Routing Protocol      : connected
Metric                        : 1
Metric Pref                   : 1
Uptime (HH:MM:SS)             : 00:00:56


Outgoing Interface List
Interface       State          Vteps
----------------------------------------
vni10000        forwarding     2.2.2.2
```

Multicast route where there is mixed L2-L3 VNI routing. In this case, traffic ingressed from VTEP 1.1.1.1 on L3VNI is routed to SVI 4007(L2VNI):

```
switch# show ip mroute 225.0.0.1 100.100.1.4 all-vrfs detail
IP Multicast Route Entries

VRF : red

Group Address                 : 225.0.0.1
Source Address                : 100.100.1.4
Neighbor                      : 1.1.1.1
Incoming interface            : vni10000
Intra-Inter Forwarded VTEP(s) :
Multicast Routing Protocol    : PIM-SM
Unicast Routing Protocol      : BGP
Metric                        : 0
Metric Pref                   : 200
Uptime (HH:MM:SS)             : 00:00:51


Outgoing Interface List
Interface       State
------------------------------
vlan4007        forwarding
```

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip multicast multi-fabric border

```
ip multicast multi-fabric border
no ip multicast multi-fabric border
```

Description

Enables PIM's border router functionality. This command must be enabled on the border router when iBGP-eBGP is not used.

The **no** form of the command disables forwarding of multicast data on the interface.

This configuration is global and is applicable to all host's VRFs configured in that router.

Examples

Configuring **ip multicast multi-fabric border** command:

```
switch# configure terminal
switch(config)#
switch(config)# ip multicast multi-fabric border <cr>
switch(config)# no ip multicast multi-fabric border <cr>
switch(config)#
switch(config)# ipv6 multicast multi-fabric border <cr>
switch(config)# no ipv6 multicast multi-fabric border <cr>
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip multicast multi-fabric identifier

```
ip multicast multi-fabric identifier-value <IDENTIFIER VALUE> <cr>
no ip multicast multi-fabric <IDENTIFIER-VALUE>
```

Description

Configures multicast fabric identifier (MFID) that uniquely represents the fabric/site to which this leaf router belongs. Shown in the PIM hello option field, this command is used by the border router to associate the neighbor to the fabric MFID. This command is applicable to all the regular leaf routers and not applicable at the shared border router.

The **no** form of the command disables forwarding of multicast data on the interface.

The same MFID value must be configured on all leaf routers belonging to the same fabric. However, the same MFID value cannot be reused between fabrics attached to the same border.

Configuration of an Identifier is optional on the VTEPs. If there is no manually configured Identifier, it will automatically use and announce the local AS Number as Identifier.

Parameter	Description
<IDENTIFIER VALUE>	Configures the given value as MFID

Examples

Configuring **ip multicast multi-fabric identifier-value** command:

```
switch(config)#
switch(config)# ip multicast multi-fabric identifier <identifier-value> <cr>
switch(config)# no ip multicast multi-fabric identifier <identifier-value> <cr>
switch(config)#
switch(config)# ipv6 multicast multi-fabric identifier <identifier-value> <cr>
switch(config)# no ipv6 multicast multi-fabric identifier <identifier-value> <cr>
```

Configuring MFID value of 1001 on two VTEPs using the same fabric:

```
On VTEP1:
vtep1(config)#
vtep1(config)# ip multicast multi-fabric identifier 1001 <cr>
```

```
On VTEP2:
vtep2(config)#
vtep2(config)# ip multicast multi-fabric identifier 1001 <cr>
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

Chapter 90

Multicast datapath commands for IPv4

show ip multicast bridging datapath

```
show ip multicast bridging datapath {group <GROUP-IP> {source <SOURCE-IP>
{vlan <VLAN-ID>}}}[vrf <VRF_NAME>] [vsx-peer]
```

Description

Displays the multicast bridge control forwarding entries on a device including replication details and hardware programming status. Displays bridging datapath details for the specified multicast flow (the group, source, VLAN, and VRF).

Parameter	Description
`group <GROUP-IP>`	Specifies a group IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255. Shows bridging datapath details for the specified group.
`source <SOURCE-IP>`	Specifies a source IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255. Shows bridging datapath details for the specified source.
`vlan <VLAN-ID>`	Specifies a VLAN. Values: 1-4094. Shows bridging datapath details for the specified VLAN.
`vrf <VRF-NAME>`	Specifies a VRF. Shows datapath information for groups joined in the specified VRF. If the ***<VRF-NAME>*** is not specified, it shows the default VRF information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

A multicast bridge control forwarding table comprises of the IP multicast destination address, source address and its association with a list of ports on which the multicast packets are replicated in a Layer 2 domain. The switch floods/ replicates the multicast packet on these ports by matching the multicast destination address, source address, and the virtual local network identifier (VLAN ID). The **show ip multicast bridging datapath** command displays the multicast bridge control forwarding entries on a device including replication details and hardware programming status.

Examples

Showing detailed bridging datapath information for the specified multicast flow:

```
switch# show ip multicast bridging datapath group 232.1.1.10 source 100.100.1.10
vlan 10
Multicast Bridging Datapath Details
VRF                           : default
Source                        : 100.100.1.10/32
Group                         : 232.1.1.10/32
Replication Group Index       : 70
Hardware Status               : active
Error Code                    : None
Retries for programming       : 0
Vlan                          : VLAN10
State                         : forwarding

VNI                           : vni1000
State                         : operational
Replication Details:
Tunnel Endpoints     State
----------------     ----------
2.2.2.2              operational
4.4.4.4              operational
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip multicast routing datapath

```
show ip multicast routing datapath {group <GROUP-IP> {source <SOURCE-IP>
{port <INCOMING-PORT>}}}[vrf <VRF_NAME>] [vsx-peer]
```

Description

Displays the multicast Layer 3 forwarding entries with replication details and hardware programming status. Displays routing datapath details for the specified multicast flow (group, source, incoming port, and VRF).

Parameter	Description
`group <GROUP-IP>`	Specifies a group IP address in IPv4 format (x.x.x.x), where x is a

Parameter	Description
	decimal number from 0 to 255. Shows datapath details for the specified group.
`source <SOURCE-IP>`	Specifies a source IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255. Shows datapath details for the specified source.
`port <INCOMING-PORT>`	Specifies the incoming port. Shows datapath details for the specified port.
`vrf <VRF-NAME>`	Specifies a VRF. Shows datapath information for the specified VRF. If the ***<VRF-NAME>*** is not specified, it shows the default VRF information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

A multicast routing protocol such as PIM populates the multicast Layer 3 forwarding table and forwards multicast traffic to clients throughout the network. A multicast forwarding table comprises of the IP multicast destination address, source address, interface on which the traffic is received, and the list of interfaces on which multicast traffic is replicated. The **show ip multicast routing datapath** command displays the multicast Layer 3 forwarding entries with replication details and hardware programming status.

Examples

Showing detailed routing datapath information for the specified multicast flow:

```
switch# show ip multicast routing datapath group 225.20.0.1 source 20.0.0.2 port
vlan20
Multicast Routing Datapath Details
VRF                           : default
Source                        : 20.0.0.2/32
Group                         : 225.20.0.1/32
Primary Upstream Interface : vlan20
From                          : pim_sm
Type                          : route
Replication Group Index     : 38923
Hardware Status              : active
Error Code                    : None
Retries for programming     : 0
Upstream Interface           : vlan20
        State                 : forwarding
        Replication Details:
        L2 Ports         State
        -----------      ----------
        1/1/4            forwarding
Downstream Interface        : vlan30
        State                 : forwarding
        Replication Details:
        L2 Ports         State
        -----------      ----------
        1/1/1            forwarding
```

```
Downstream Interface       : vlan40
        State              : forwarding
        Replication Details:
        L2 Ports        State
        -----------     ----------
        1/1/2           forwarding
        1/1/3           forwarding
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 91

Multicast datapath commands for IPv6

show ipv6 multicast bridging datapath

```
show ipv6 multicast bridging datapath {group <GROUP-IP> {source <SOURCE-IP>
{vlan <VLAN-ID>}}}[vrf <VRF_NAME>]]]] [vsx-peer]
```

Description

Displays the multicast bridge control forwarding entries on a device including replication details and hardware programming status. Displays bridging datapath details for the specified multicast flow (the group, source, VLAN, and VRF).

Parameter	Description
`group <GROUP-IP>`	Specifies a group IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F. Shows bridging datapath details for the specified group.
`source <SOURCE-IP>`	Specifies a source IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F. Shows bridging datapath details for the specified source.
`vlan <VLAN-ID>`	Specifies a VLAN. Range 1 to 4094. Shows bridging datapath details for groups joined in the specified VLAN.
`vrf <VRF-NAME>`	Specifies a VRF. Shows bridging datapath information for groups joined in the specified VRF. If the ***<VRF-NAME>*** is not specified, it shows the default VRF information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

A multicast bridge control forwarding table comprises of the IP multicast destination address, source address and its association with a list of ports on which the multicast packets are replicated in a Layer 2 domain. The switch floods/ replicates the multicast packet on these ports by matching the multicast destination address, source address, and the virtual local network identifier (VLAN ID). The **show ipv6 multicast bridging datapath** command displays the multicast bridge control forwarding entries on a device including replication details and hardware programming status.

Examples

Showing detailed bridging datapath information for the specified multicast flow:

```
switch# show ipv6 multicast bridging datapath group ff03::0 source 1010:22::4 vlan
10
Multicast Bridging Datapath Details
VRF                          : default
Source                       : 1010:22::4/128
Group                        : ff03::/128
Replication Group Index      : 70
Hardware Status              : active
Error Code                   : None
Retries for programming      : 0
Vlan                         : VLAN10
        State                : forwarding
        Replication Details:
        L2 Ports        State
        -----------     ----------
        1/1/6           forwarding
        1/1/7           forwarding
VNI                          : vni1000
        State                : operational
        Replication Details:
        Tunnel Endpoints     State
        ----------------     ----------
        2.2.2.2              operational
        4.4.4.4              operational
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 multicast routing datapath

```
show ipv6 multicast routing datapath {group <GROUP-IP> {source <SOURCE-IP>
{port <INCOMING-PORT>}}} [vrf <VRF_NAME>] [vsx-peer]
```

Description

Displays the multicast Layer 3 forwarding entries with replication details and hardware programming status. Displays routing datapath details for the specified multicast flow (group, source, incoming port, and VRF).

Parameter	Description
`group <GROUP-IP>`	Specifies a group IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F. Shows datapath details for the specified group.
`source <SOURCE-IP>`	Specifies a source IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F. Shows datapath details for the specified source.
`port <INCOMING-PORT>`	Specifies the incoming port. Shows datapath details for the specified port.
`vrf <VRF-NAME>`	Specifies a VRF. Shows datapath information for groups joined in the specified VRF. If the ***<VRF-NAME>*** is not specified, it shows the default VRF information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

A multicast routing protocol such as PIM populates the multicast Layer 3 forwarding table and forwards multicast traffic to clients throughout the network. A multicast forwarding table comprises of the IP multicast destination address, source address, interface on which the traffic is received, and the list of interfaces on which multicast traffic is replicated. The **show ipv6 multicast routing datapath** command displays the multicast Layer 3 forwarding entries with replication details and hardware programming status.

Examples

Showing detailed routing datapath information for the specified multicast flow:

```
switch# show ip multicast routing datapath group 225.20.0.1 source 20.0.0.2 port
vlan20
Multicast Routing Datapath Details
VRF                           : default
Source                        : 20.0.0.2/32
Group                         : 225.20.0.1/32
Primary Upstream Interface : vlan20
From                          : pim_sm
Type                          : route
Replication Group Index     : 38923
Hardware Status               : active
Error Code                    : None
Retries for programming     : 0
Upstream Interface          : vlan20
        State                 : forwarding
        Replication Details:
        L2 Ports        State
        -----------     ----------
        1/1/4           forwarding
Downstream Interface        : vlan30
        State                 : forwarding
        Replication Details:
        L2 Ports        State
        -----------     ----------
        1/1/1           forwarding
Downstream Interface        : vlan40
        State               : forwarding
        Replication Details:
        L2 Ports        State
        -----------     ----------
        1/1/2           forwarding
        1/1/3           forwarding
```

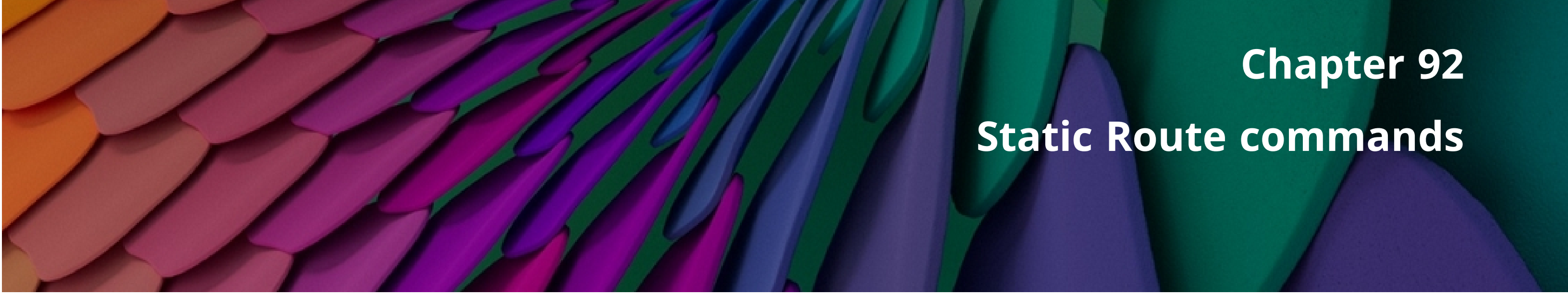
For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 92

Static Route commands

ip multicast-static-route

ip multicast-static-route *<INCOMING-INTERFACE-NAME>* {*<SOURCE-ADDRESS* | *ANY>*} *<GROUP-ADDRESS>* [*<OUTGOING-INTERFACE-NAME>*] vrf *<VRF-NAME>*
no ip multicast-static-route *<INCOMING-INTERFACE-NAME>* {*<SOURCE-ADDRESS* | *ANY>*} *<GROUP-ADDRESS>* [*<OUTGOING-INTERFACE-NAME>*] vrf *<VRF-NAME>*

Description

Configures a multicast static route for (source, group) on an incoming interface with outgoing interface (s) not involving L3VNI. If a vrf is not specified, default vrf is used.

The **no** form of this command removes the configuration.

Parameter	Description
<INCOMING-INTERFACE-NAME>	Specifies the multicast stream incoming interface name.
<SOURCE-ADDRESS>	Selects the IPv4 source address.
<ANY>	Selects any source address.
<GROUP-ADDRESS>	Specifies the IPv4 multicast group address.
<OUTGOING-INTERFACE-NAME>	Specifies the outgoing interface name.
vrf *<VRF-NAME>*	Configures the specified VRF. The default is default vrf.

Usage

If the incoming interface is attached to different vrf than the vrf spcified in the multicast static route command, route will be made inactive. If the vrf mismatch occurs for the outgoing interface, that particular outgoing interface will be made inactive. If no outgoing interface is specified, the multicast traffic is not routed and is bridged on the interface (SVI) on which the traffic is received.

Examples

Configuring Multicast Static Route with a outgoing interface:

```
switch(config)# ip multicast-static-route vlan10 10.10.1.2 239.255.255.250 vlan20
```

Removing the configured Multicast Static Route with a outgoing interface:

```
switch(config)# no ip multicast-static-route vlan10 10.10.1.2 239.255.255.250
vlan20
```

Configuring Multicast Static Route without an outgoing interface to bridge traffic only in incoming interface in default vrf:

```
switch(config)# ip multicast-static-route vlan30 30.30.1.2 239.255.255.250
```

Removing the configured Multicast Static Route without an outgoing interface to bridge traffic only in incoming interface in default vrf:

```
switch(config)# no ip multicast-static-route vlan30 30.30.1.2 239.255.255.250
```

Configuring Multicast Static Route without an outgoing interface to bridge traffic only in incoming interface in non-default vrf:

```
switch(config)# ipv6 multicast-static-route vlan30 30.30.1.2 239.255.255.250 vrf
red
```

Removing the configured Multicast Static Route without an outgoing interface to bridge traffic only in incoming interface in non-default vrf:

```
switch(config)# ipv6 multicast-static-route vlan30 30.30.1.2 239.255.255.250 vrf
red
```

Configuring Multicast Static Route with multiple outgoing interfaces:

```
switch(config)# ip multicast-static-route vlan40 40.40.1.2 239.255.255.250 vlan50
vrf red
switch(config)# ip multicast-static-route vlan40 40.40.1.2 239.255.255.250 vlan60
vrf red
switch(config)# ip multicast-static-route vlan40 40.40.1.2 239.255.255.250 1/1/1
vrf red
```

Removing configured Multicast Static Route with multiple outgoing interfaces:

```
switch(config)# no ip multicast-static-route vlan40 40.40.1.2 239.255.255.250
vlan60 vrf red
switch(config)# no ip multicast-static-route vlan40 40.40.1.2 239.255.255.250 vrf
red
```

Configuring Static (*, Group) Multicast Route with multiple outgoing interfaces:

```
switch(config)# ip multicast-static-route vlan50 any 239.255.255.250 vlan70 vrf
red
switch(config)# ip multicast-static-route vlan50 any 239.255.255.250 vlan80 vrf
red
```

Removing configured Static (*, Group) Multicast Route with multiple outgoing interfaces:

```
switch(config)# no ip multicast-static-route vlan50 any 239.255.255.250 vlan70 vrf
red
switch(config)# no ip multicast-static-route vlan50 any 239.255.255.250 vlan80 vrf
red
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip multicast-static-route (l3vni)

```
ip multicast-static-route <INCOMING-INTERFACE-NAME> {<SOURCE-ADDRESS | ANY>} <GROUP-
ADDRESS>  vrf <VRF-NAME>
ip multicast-static-route <VXLAN1> {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS> [<OUTGOING-
INTERFACE-NAME>]vrf <VRF-NAME>
no ip multicast-static-route <INCOMING-INTERFACE-NAME> {<SOURCE-ADDRESS | ANY>} <GROUP-
ADDRESS>  vrf <VRF-NAME>
no ip multicast-static-route {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS> [<OUTGOING-
INTERFACE-NAME>]vrf <VRF-NAME>
```

Description

Configures a multicast static route for (source, group) involving L3VNI tunnels. If a vrf is not specified, default vrf is used.

The **no** form of this command removes the configuration.

Parameter	Description
<INCOMING-INTERFACE-NAME>	Specifies the multicast stream incoming interface name.
<SOURCE-ADDRESS>	Selects the IPv4 source address.
<ANY>	Selects any source address.
<GROUP-ADDRESS>	Specifies the IPv4 multicast group address.
<OUTGOING-INTERFACE-NAME>	Specifies the outgoing interface name.
vrf <*VRF-NAME*>	Configures the specified VRF. The default is default vrf.

Usage

If the incoming interface is attached to different vrf than the vrf spcified in the multicast static route command, route will be made inactive. If the vrf mismatch occurs for the outgoing interface, that particular outgoing interface will be made inactive.

Examples

Configuring Multicast Static Route with L2VN1 to SVI:

```
switch(config)# ip multicast-static-route vlan10 10.10.1.2 239.255.255.250 vlan30
```

Removing the configured Multicast Static Route with L2VN1 to SVI:

```
switch(config)# no ip multicast-static-route vlan10 10.10.1.2 239.255.255.250
vlan30
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ipv6 multicast-static-route

```
ipvy multicast-static-route <INCOMING-INTERFACE-NAME> {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS> [<OUTGOING-INTERFACE-NAME>] vrf <VRF-NAME>
no ipv6 multicast-static-route <INCOMING-INTERFACE-NAME> {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS> [<OUTGOING-INTERFACE-NAME>] vrf <VRF-NAME>
```

Description

Configures a multicast static route for (source, group) on an incoming interface with outgoing interface (s) not involving L3VNI. If a vrf is not specified, default vrf is used.

The **no** form of this command removes the configuration.

Parameter	Description
<INCOMING-INTERFACE-NAME>	Specifies the multicast stream incoming interface name.
<SOURCE-ADDRESS>	Selects the IPv6 source address.

Parameter	Description
<ANY>	Selects any source address.
<GROUP-ADDRESS>	Specifies the IPv6 multicast group address.
<OUTGOING-INTERFACE-NAME>	Specifies the outgoing interface name.
vrf *<VRF-NAME>*	Configures the specified VRF. The default is default vrf.

Usage

If the incoming interface is attached to different vrf than the vrf spcified in the multicast static route command, route will be made inactive. If the vrf mismatch occurs for the outgoing interface, that particular outgoing interface will be made inactive.

Examples

Configuring Multicast Static Route with a outgoing interface:

```
switch(config)# ipv6 multicast-static-route vlan10 2001::1 ff02::c vlan20
```

Removing the configured Multicast Static Route with a outgoing interface:

```
switch(config)# no ipv6 multicast-static-route vlan10 2001::1 ff02::c vlan20
```

Configuring Static (*, Group) Multicast Route with multiple outgoing interfaces:

```
switch(config)# ipv6 multicast-static-route vlan50 any ff0e::c vlan70 vrf red
switch(config)# ipv6 multicast-static-route vlan50 any ff0e::c vlan80 vrf red
```

Removing configured Static (*, Group) Multicast Route with multiple outgoing interfaces:

```
switch(config)# no ipv6 multicast-static-route vlan50 any ff0e::c vlan70 vrf red
switch(config)# no ipv6 multicast-static-route vlan50 any ff0e::c vlan80 vrf red
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ipv6 multicast-static-route (l3vni)

```
ipv6 multicast-static-route <INCOMING-INTERFACE-NAME> {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS>  vrf <VRF-NAME>
ipv6 multicast-static-route  {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS> [<OUTGOING-INTERFACE-NAME>]vrf <VRF-NAME>
no ipv6 multicast-static-route <INCOMING-INTERFACE-NAME> {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS> vrf <VRF-NAME>
no ipv6 multicast-static-route  {<SOURCE-ADDRESS | ANY>} <GROUP-ADDRESS> [<OUTGOING-INTERFACE-NAME>]vrf <VRF-NAME>
```

Description

Configures a multicast static route for (source, group) involving L3VNI tunnels. If a vrf is not specified, default vrf is used.

The **no** form of this command removes the configuration.

Parameter	Description
<INCOMING-INTERFACE-NAME>	Specifies the multicast stream incoming interface name.
<SOURCE-ADDRESS>	Selects the IPv6 source address.
<ANY>	Selects any source address.
<GROUP-ADDRESS>	Specifies the IPv6 multicast group address.
<OUTGOING-INTERFACE-NAME>	Specifies the outgoing interface name.
vrf <*VRF-NAME*>	Configures the specified VRF. The default is default vrf.

Usage

If the incoming interface is attached to different vrf than the vrf spcified in the multicast static route command, route will be made inactive. If the vrf mismatch occurs for the outgoing interface, that particular outgoing interface will be made inactive.

Examples

Configuring Multicast Static Route with L2VN1 to SVI:

```
switch(config)# ipv6 multicast-static-route vlan10 2001::1 ff02::c vlan30
```

Removing the configured Multicast Static Route with L2VN1 to SVI:

```
switch(config)# no ipv6 multicast-static-route vlan10 2001::1 ff02::c vlan30
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

redistribute static

```
redistribute static
no redistribute static
```

Description

Exports all static multicast routes configured on a VRF to the corresponding PIM router. The **no** form of this command disables the redistribution.

Usage

Static multicast routes give the flexibility to program a specific path for multicast traffic from the source to the client without having to rely on the underlying protocols to build a multicast route. They can be configured on all the routers in the path or on a specific section of routers. The remaining section of routers can be configured to run the native PIM protocol. In such cases, the static multicast route is exported to PIM domain as PIM joins using this command.

Examples

Configuring redistribute static routes to PIM for IPv4:

```
switch(config)# router pim
switch(config-pim)# redistribute static
```

Disabling redistribute static routes to PIM for IPv4:

```
switch(config)# router pim
switch(config-pim)# no redistribute static
```

Configuring redistribute static routes to PIM for IPv4 on vrf red:

```
switch(config)# router pim vrf red
switch(config-pim)# redistribute static
```

Disabling redistribute static routes to PIM for IPv4 on vrf red:

```
switch(config)# router pim vrf red
switch(config-pim)# no redistribute static
```

Configuring redistribute static routes to PIM for IPv6:

```
switch(config)# router pim6
switch(config-pim)# redistribute static
```

Disabling redistribute static routes to PIM for IPv6:

```
switch(config)# router pim6
switch(config-pim)# no redistribute static
```

Configuring redistribute static routes to PIM for IPv6 on vrf red:

```
switch(config)# router pim6 vrf red
switch(config-pim)# redistribute static
```

Disabling redistribute static routes to PIM for IPv6 on vrf red:

```
switch(config)# router pim6 vrf red
switch(config-pim)# no redistribute static
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-pim`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities multicast static route

```
show capacities multicast-static-route
show capacities-status multicast-static route
```

Description

Displays the maximum number of IPv4 and IPv6 static multicast routes that can be configured on the devices.

Examples

Displaying the maximum number of multicast static routes configured on the device:

```
switch# show capacities static-multicast-route
System Capacities: Filter Static Multicast Route
Capacities Name                                                           Value
----------------------------------------------------------------------------------
---
Maximum number of IPv4/IPv6 Static multicast nexthops supported           65536
Maximum number of IPv4/IPv6 Static multicast routes supported             4096
Maximum number of IPv4/IPv6 Summarized static multicast routes supported  1024

switch# show capacities-status static-multicast-route
System Capacities Status: Filter Static Multicast Route
Capacities Status Name                                 Value    Maximum
----------------------------------------------------------------------------------
---
Number of IPv4/IPv6 Static multicast nexthops           10      65536
Number of IPv4/IPv6 Static multicast routes             33      4096
Number of IPv4/IPv6 Summarized static multicast routes  6       1024
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip multicast-static-route

`show ip multicst-static-route [all vrfs | vrf <VRF-NAME>]`

Description

Displays the multicast static route and corresponding summarized route information for the specified VRF. If VRF is not specified, the default VRF is displayed.

Parameter	Description
[all vrfs]	Selects all VRFs to display.
[vrf *<VRF-NAME>*]	Specifies the VRF to display. The default is default vrf.

Examples

Displaying the multicast static route and corresponding summarized route information for all vrfs:

```
switch# show ip multicast-static-route all-vrfs
VRF : red
```

```
Group Address                  : 239.255.255.250
Source Address                 : 40.40.40.2
Route type                     : Static
Incoming interface             : 1/1/2
Outgoing Interface List        :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                  : 239.255.255.250
Source Address                 : Any
Route type                     : Static-Summarized
Incoming interface             : 1/1/3
Outgoing Interface List        :
Interface      State
---------      -----
vlan20         forwarding
vlan30         forwarding
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip multicast-static-route detail

```
show ip multicst-static-route <GROUP-ADDRESS> {<SOURCE-ADDRESS | ANY>} detail [all vrfs |
vrf <VRF-NAME>]
```

Description

Displays the multicast static route and corresponding summarized route information for the given group address in the given VRF detail. If VRF is not specified, the default VRF is displayed.

Parameter	Description
<GROUP-ADDRESS>	Specifies the group address.
<SOURCE-ADDRESS>	Specifies the source address.
<ANY>	Selects any source address.

Parameter	Description
[all vrfs]	Selects all VRFs to display.
[vrf <*VRF-NAME*>]	Specifies the VRF to display. The default is default vrf.

Examples

Displaying the multicast static route information for a specific group:

```
switch# show ip multicast-static-route 239.255.255.250 40.40.40.3 detail vrf red

VRF : red

Group Address                 : 239.255.255.250
Source Address                : 40.40.40.2
Route type                    : Static
Incoming interface            : 1/1/2
Outgoing Interface List       :
Interface      State        Vteps
---------      -----        -----
vni1000        forwarding   2.2.2.2, 3.3.3.3
```

Displaying the multicast static route information for any group on vrf red:

```
switch# show ip multicast-static-route 239.255.255.250 any detail vrf red
VRF : red

Group Address                 : 239.255.255.250
Source Address                : Any
Route type                    : Static
Incoming interface            : 1/1/2
Outgoing Interface List       :

Interface      State        Vteps
---------      -----        -----
vni1000        forwarding   2.2.2.2, 3.3.3.3
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip multicast-static-route (group)

```
show ip multicast-static-route <GROUP-ADDRESS> {<SOURCE-ADDRESS | ANY>} [all vrfs | vrf
<VRF-NAME>]
```

Description

Displays the multicast static route and corresponding summarized route information for the given group address in the given VRF briefly. If VRF is not specified, the default VRF is displayed.

Parameter	Description
<GROUP-ADDRESS>	Specifies the group address.
<SOURCE-ADDRESS>	Specifies the source address.
<ANY>	Selects any source address.
[all vrfs]	Selects all VRFs to display.
[vrf *<VRF-NAME>*]	Specifies the VRF to display. The default is default vrf.

Examples

Displaying the multicast static route information for all vrfs:

```
switch# show ip multicast-static-route 239.255.255.250 all-vrfs

VRF : red

Group Address                  : 239.255.255.250
Source Address                 : 40.40.40.2
Route type                     : Static
Incoming interface             : 1/1/2
Outgoing Interface List        :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                  : 239.255.255.250
Source Address                 : Any
Route type                     : Static-summarized
Incoming interface             : 1/1/3
Outgoing Interface List        :
Interface      State
---------      -----
vlan20         forwarding
vlan30         forwarding
```

Displaying the multicast static route information for a specific group on vrf red:

```
switch# show ip multicast-static-route 239.255.255.250 40.40.40.4 vrf red
VRF : red

Group Address                  : 239.255.255.250
Source Address                 : Any
Route type                     : Static
Incoming interface             : 1/1/2
```

```
Outgoing Interface List       :
Interface      State
---------      -----
vlan10         forwarding
```

Displaying the multicast static route information for a specific group and source :

```
switch# show ip multicast-static-route 239.255.255.250 40.40.40.2 all-vrfs
VRF : red

Group Address                 : 239.255.255.250
Source Address                : 40.40.40.2
Route type                    : Static
Incoming interface            : 1/1/2
Outgoing Interface List       :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                 : 239.255.255.250
Source Address                : 40.40.40.2
Route type                    : Static
Incoming interface            : vlan40
Outgoing Interface List       :
Interface      State
---------      -----
vlan20         forwarding
vlan30         forwarding
```

Displaying the multicast static route information for a specific group and any source :

```
switch# show ip multicast-static-route 239.255.255.250 any all-vrfs
VRF : red

Group Address                 : 239.255.255.250
Source Address                : Any
Route type                    : Static-summarized
Incoming interface            : 1/1/2
Outgoing Interface List       :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                 : 239.255.255.250
Source Address                : Any
Route type                    : Static-summarized
Incoming interface            : vlan40
Outgoing Interface List       :
Interface      State
---------      -----
vlan20         forwarding
vlan30         forwarding
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 multicast-static-route

`show ipv6 multicast-static-route [all vrfs | vrf <VRF-NAME>]`

Description

Displays the multicast static route and corresponding summarized route information for the specified VRF. If VRF is not specified, the default VRF is displayed.

Parameter	Description
[all vrfs]	Selects all VRFs to display.
[vrf <*VRF-NAME*>]	Specifies the VRF to display. The default is default vrf.

Examples

Displaying the multicast static route and corresponding summarized route information for all vrfs:

```
switch# show ipv6 multicast-static-route all-vrfs

VRF : red

Group Address                 : ff0e::c
Source Address                : 2001::2
Route type                    : Static
Incoming interface            : vlan200
Outgoing Interface List       :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                 : ff0e::c
Source Address                : Any
Route type                    : Static-Summarized
Incoming interface            : vlan200
Outgoing Interface List       :
Interface      State
---------      ----------
vlan10        forwarding
```

Displaying the multicast static route information for a specific group:

```
switch# show ipv6 multicast-static-route ff0e::c all-vrfs

VRF : red

Group Address                 : ff0e::c
Source Address                : 2001::2
Route type                    : Static
Incoming interface            : vlan200
Outgoing Interface List       :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                 : ff0e::c
Source Address                : Any
Route type                    : Static-Summarized
Incoming interface            : vlan200
Outgoing Interface List       :
Interface      State
---------      ----------
vlan10         forwarding
```

Displaying the multicast static route information for a specific group and source:

```
switch# show ipv6 multicast-static-route ff0e::c 2001::2 all-vrfs

VRF : red

Group Address                 : ff0e::c
Source Address                : 2001::2
Route type                    : Static
Incoming interface            : vlan100
Outgoing Interface List       :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                 : ff0e::c
Source Address                : 200::2
Route type                    : Static
Incoming interface            : vlan200
Outgoing Interface List       :
Interface      State
---------      ----------
vlan10         forwarding
```

Displaying the multicast static route information for a specific group and any source:

```
switch# show ipv6 multicast-static-route ff0e::c any all-vrfs

VRF : red

Group Address                 : ff0e::c
Source Address                : Any
Route type                    : Static-summarized
```

```
Incoming interface              : 1/1/3
Outgoing Interface List         :
Interface      State
---------      -----
vlan10         forwarding

VRF : blue

Group Address                   : ff0e::c
Source Address                  : Any
Route type                      : Static-summarized
Incoming interface              : vlan200
Outgoing Interface List         :
Interface      State
---------      ----------
vlan10         forwarding
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 multicast-static-route (group)

```
show ipv6 multicst-static-route <GROUP-ADDRESS> {<SOURCE-ADDRESS> | ANY>} [all vrfs | vrf
<VRF-NAME>]
```

Description

Displays the multicast static route and corresponding summarized route information for the given group address in the given VRF briefly. If VRF is not specified, the default VRF is displayed.

Parameter	Description
<GROUP-ADDRESS>	Specifies the group address.
<SOURCE-ADDRESS>	Specifies the source address.
<ANY>	Selects any source address.
[all vrfs]	Selects all VRFs to display.
[vrf *<VRF-NAME>*]	Specifies the VRF to display. The default is default vrf.

Examples

Displaying the multicast static route information for a specific group:

```
switch# show ipv6 multicast-static-route ff0e::c 2002::2 vrf red


VRF : red

Group Address                  : ff0e::c
Source Address                 : 2002::2
Route type                     : Static
Incoming interface             : 1/1/2
Outgoing Interface List        :
Interface      State
---------      -----
vlan10         forwarding
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 multicast-static-route detail

`show ipv6 multicast-static-route <GROUP-ADDRESS> {<SOURCE-ADDRESS | ANY>} detail [all vrfs | vrf <VRF-NAME>]`

Description

Displays the multicast static route and corresponding summarized route information for the given group address in the given VRF detail. If VRF is not specified, the default VRF is displayed.

Parameter	Description
<GROUP-ADDRESS>	Specifies the group address.
<SOURCE-ADDRESS>	Specifies the source address.
<ANY>	Selects any source address.
[all vrfs]	Selects all VRFs to display.
[vrf <*VRF-NAME*>]	Specifies the VRF to display. The default is default vrf.

Examples

Displaying the multicast static route information for a specific group:

```
switch# show ipv6 multicast-static-route ff0e::c 2002::2 detail vrf red
VRF : red

Group Address                  : ff0e::c
Source Address                 : 2002:2
Route type                     : Static
Incoming interface             : 1/1/2
Outgoing Interface List        :
Interface       State         Vteps
---------       -----         -----
vni1000         forwarding    2.2.2.2, 3.3.3.3
```

Displaying the multicast static route information for any group on vrf red:

```
switch# show ipv6 multicast-static-route ff0e::c any detail vrf red
VRF : red

Group Address                  : ff0e::c
Source Address                 : Any
Route type                     : Static
Incoming interface             : 1/1/2
Outgoing Interface List        :
Interface       State         Vteps
---------       -----         -----
vni1000         forwarding    2.2.2.2, 3.3.3.3
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config

`show running-config`

Description

Displays the running configuration.

Examples

Displaying the running configuration:

```
switch# show running-config
!
```

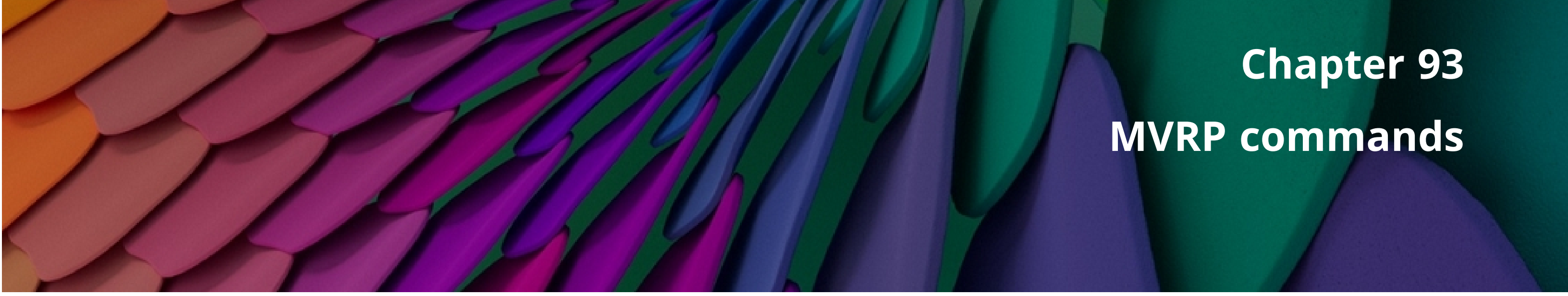
```
-----------
-----------
ip multicast-static-route vlan10 10.10.1.2 239.255.255.250 vlan20
ip multicast-static-route vlan10 10.10.1.2 239.255.255.250 1/1/2
ip multicast-static-route vlan21 any 239.255.255.250 1/1/2
ip multicast-static-route vlan30 10.10.1.2 239.255.255.250 1/1/16 vrf red
ip multicast-static-route 1/1/1 10.10.1.2 239.255.255.250 1/1/2
ipv6 multicast-static-route vlan10 2001::1 ff02::c vlan20
ipv6 multicast-static-route vlan50 any ff0e::c vlan70 vrf red
ipv6 multicast-static-route vlan50 any ff0e::c vlan80 vrf red
ipv6 multicast-static-route vlan10 2001::1 ff02::c vlan20
ipv6 multicast-static-route vlan10 2001::1 ff02::c 1/1/1
```

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 93
MVRP commands

clear mvrp statistics

```
clear mvrp statistics [<PORT-NUM> | <PORT-LIST> | LAG <LAG-NUM>]
```

Description

Resets the MVRP statistic counters globally or for the specified ports or LAG.

Parameter	Description
<PORT-NUM>	Specifies a port number.
<PORT-LIST>	Specifies a list of ports.
LAG *<LAG-NUM>*	Specifies a Link Aggregation number. Range: 1 to 128.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# clear mvrp statistics 1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

mvrp

```
mvrp
no mvrp
```

Description

Enables the MVRP feature globally or on a specific interface. By default, MVRP is disabled.

The **no** form of this command disables MVRP.

MVRP and VLAN translation cannot be enabled on the same interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling MVRP globally:

```
switch(config)# mvrp
```

Enabling MVRP on an interface:

```
switch(config)# interface 1/1/1
switch(config-if)# mvrp
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` `config-if`	Administrators or local user group members with execution rights for this command.

mvrp registration

```
mvrp registration {normal | fixed | forbidden [<VLAN-LIST>]}
no mvrp registration forbidden {<VLAN-LIST>}
```

Description

Configures the MVRP registrar state which determines how an MVRP participant responds to MRP messages. The default registration mode is normal.

The `no` command removes the specified VLANs from the forbidden list.

Parameter	Description
`normal`	Enables dynamic registration and deregistration of VLANs on the interface, and propagates VLAN information to other switches on the network. Default.
`fixed`	Disables dynamic deregistration of VLANs and drops received MVRP frames. The interface does not deregister dynamic VLANs or register new dynamic VLANs.
`forbidden`	Disables dynamic registration of VLANs and drops received MVRP frames. The MVRP participant does not register new dynamic VLANs or re-register a deregistered dynamic VLAN.
`<VLAN-LIST>`	Disables dynamic registration of VLANs and drops received MVRP frames for specific VLANs only. Normal behavior applies to all other VLANs. Specify the number of a single VLAN, or a series of numbers for a range of VLANs, separated by commas (1, 2, 3, 4), dashes (1-4), or both (1-4,6).

Examples

```
switch(config)# switch(config-if)# mvrp registration forbidden 10
```

```
switch(config-if)# mvrp registration fixed
```

```
switch(config-if)# mvrp registration forbidden 1,2,10-20
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

mvrp timer

```
mvrp timer {join | leave | leaveall | periodic} <TIME>
no mvrp timer {join | leave | leaveall | periodic}
```

Description

Sets an MVRP timer.

The **no** form of this command sets the specified timer to its default value.

Parameter	Description
`join <TIME>`	Sets the join timer. You can use the timer to space MVRP join messages. To ensure that join messages are transmitted to other participants, an MRP participant waits for the specified period of the join timer before sending a join message. The Join timer must be less than half of the Leave Timer. Range: 20 to 100 in centiseconds. Default: 20.
`leave <TIME>`	Sets the leave timer for the port, specifying the time that the registrar state machine waits in the LV state before transiting to the MT state. The leave timer must be at least twice the join timer and must be less than the leave all timer. Range: 40 - 1000000 centiseconds. Default: 300 centiseconds.
`leaveall <TIME>`	Sets the leave all timer for the port, specifying the frequency with which the leave all state machine generates leave alll PDUs. Range: 500 to1000000 centiseconds. Default: 1000.
`periodic <TIME>`	Sets the periodic timer for the port, specifying the frequency with which the periodic transmission state machine generates periodic events. The periodic timer is set to 1 second when it is started. Range: 100 to 1000000 centiseconds. Default: 100.

Examples

```
switch(config-if)# mvrp timer join 22
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if`	Administrators or local user group members with execution rights for this command.

show mvrp config

`show mvrp config [<PORT-NUM> | <PORT-LIST> | LAG <LAG-NUM>] [vsx-peer]`

Description

Displays the MVRP configuration for all L2 ports or optionally for the ports specified.

Parameter	Description
<PORT-NUM>	Specifies displaying information for a particular port number.
<PORT-LIST>	Specifies displaying information for a list of ports.
LAG *<LAG-NUM>*	Specifies displaying information by LAG. Range: 1 to 128.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# show mvrp config
Configuration and Status - MVRP
Global MVRP status : Disabled
Port    Status    Registration Join  Leave  LeaveAll Periodic
                  Type         Timer Timer  Timer    Timer
------- -------- --------      -----  ----- ------   --------
1/1/1    Disabled  Normal         20   300   1000     100
1/1/2    Disabled  Normal         20   300   1000     100
1/1/3    Disabled  Normal         20   300   1000     100
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mvrp state

`show mvrp state [<VLAN-ID> | <VLAN-ID> <PORT-NUM>]  [vsx-peer]`

Description

Displays the MVRP Registrar and Applicant state machine information for all ports on which MVRP is enabled, or for specific ports.

Parameter	Description
<VLAN-ID>	Specifies the number of a VLAN.
<PORT-NUM>	Specifies a physical port on the switch. Forrmat: **member/slot/port**.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# show mvrp state 1
Configuration and Status - MVRP state for VLAN 1
Port   VLAN Registrar Applicant
            State     State
----   ---- --------- ---------
1/1/1  1    MT       QA
```

```
switch# show mvrp state 10 1/1/1
Configuration and Status - MVRP state for VLAN 10
Port   VLAN Registrar Applicant Forbid
            State     State     Mode
----   ---- --------- --------- ---------
1/1/1  10   MT        LO        Yes
switch#
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show mvrp statistics

`show mvrp statistics [<PORT-LIST>] [vsx-peer]`

Description

Displays MVRP statistics for all ports or on the ports specified in the list.

Parameter	Description
<PORT-LIST>	Specifies a list of ports. When specifying a list of ports, the ports for which there are no statistics will be listed in the output.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

```
switch# show mvrp statistics
Status and Counters - MVRP
MVRP statistics for port : 1/1/1
----------------------------
Failed registration   : 0
Last PDU origin       : 48:0f:cf:af:b1:76
Total PDU Transmitted : 13127
Total PDU Received    : 327
Frames Discarded      : 0
Message type    Transmitted     Received
-------------- ------------ ------------
New                       0            0
Empty              50029394         1264
In                        0            4
Join Empty             1425           48
Join In                 563          555
Leave                     0            0
Leaveall              12218           25
```

```
switch# show mvrp statistics  1/1/1

Status and Counters - MVRP
MVRP statistics for port : 1/1/1
----------------------------
Failed registration   : 0
Last PDU origin       : 48:0f:cf:af:b1:76
Total PDU Transmitted : 14874
Total PDU Received    : 327
Frames Discarded      : 0
Message type    Transmitted     Received
-------------- ------------ ------------
New                       0            0
Empty              57181612         1264
In                        0            4
Join Empty             1425           48
Join In                 563          555
Leave                     0            0
Leaveall              13965           25
```

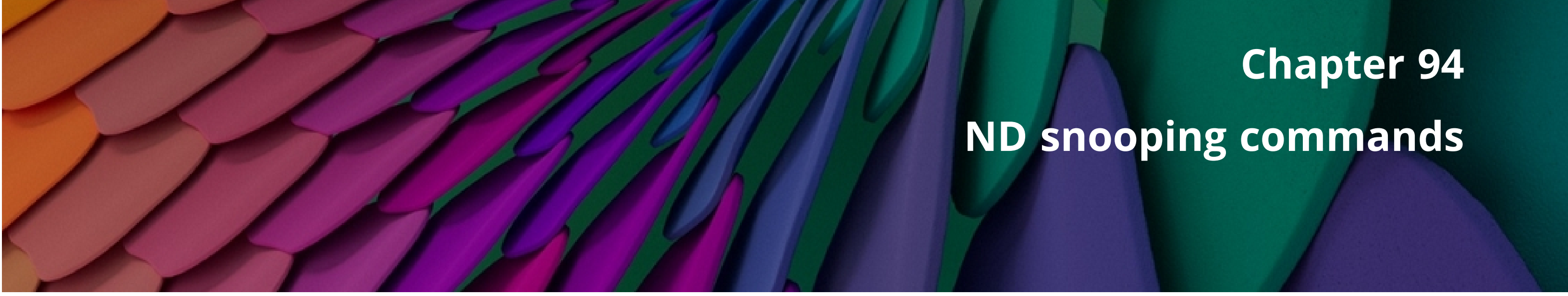
For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 94

ND snooping commands

clear nd-snooping binding

```
clear nd-snooping bindings {all | ipv6 <IPV6-ADDR> vlan <VLAN-ID> |
      port <PORT-NUM> | vlan <VLAN-ID>}
```

Description

Clears ND snooping binding entries.

Command context

Parameter	Description
`all`	Specifies that all ND binding information is to be cleared.
`ip <IPV6-ADDR> vlan <VLAN-ID>`	Specifies the IPv6 address and VLAN for which all ND binding information is to be cleared.
`port <PORT-NUM>`	Specifies the port (interface) for which all ND binding information is to be cleared.
`vlan <VLAN-ID>`	Specifies the VLAN for which all ND binding information is to be cleared. Range: 1 to 4094.

Examples

On the 6400 Switch Series, interface identification differs.

Clearing all ND binding information for 5000::1 vlan 1:

```
switch(config)# clear nd-snooping bindings ipv6 5000::1 vlan 1
```

Clearing all ND binding information for port 1/1/10:

```
switch(config)# clear nd-snooping bindings port 1/1/10
```

Clearing all ND binding information for VLAN 10:

```
switch(config)# clear nd-snooping bindings vlan 10
```

Clearing all ND binding information:

```
switch(config)# clear nd-snooping bindings all
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear nd-snooping ra-guard-policy statistics

```
clear nd-snooping ra-guard-policy statistics [vlan <VLAN-ID>]|[interface <IFNAME>]
```

Description

Clear all RA Guard policy statistics from the specified interface or VLAN.

Command context

Parameter	Description
`vlan <VLAN-ID>`	Clear all RA Guard policy information on the specified VLAN
`interface <IFNAME>`	Clear all RA Guard policy information on the specified interface

Examples

Clear all RA Guard policy statistics for VLAN 10:

```
switch# clear nd-snooping ra-guard-policy statistics vlan 10
```

Clear all RA Guard policy statistics for interface 1/1/10

```
switch# clear nd-snooping ra-guard-policy statistics interface 1/1/10
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear nd-snooping statistics

```
clear nd-snooping statistics
```

Description

Clears all ND snooping statistics.

Examples

Clear all ND snooping statistics:

```
switch# clear nd-snooping statistics
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

diag-dump nd-snooping basic

```
diag-dump nd-snooping basic
```

Description

This command displays information about the ND-Snooping configuration and runtime context.

Examples

The following example displays sample output for this command.

```
switch# diag-dump nd-snooping basic
=========================================================================
[Start] Feature nd-snooping Time : Tue Mar 29 02:53:59 2022
=========================================================================
-------------------------------------------------------------------------
[Start] Daemon ipsavd
-------------------------------------------------------------------------
Feature nd-snooping:

  Global ND snoop = ENABLED
  ND snoop MAC check = ENABLED

VLAN    ND-Snooping   ND-Guard   RA-Guard   RA-Guard-Log   RA-Drop
----    -----------   --------   --------   ------------   -------
1       ENABLED       ENABLED    ENABLED    DISABLED       DISABLED

  Statistics
  Counter Name                     Count
  ------------                     -----
  ra_recd_on_trusted_port          0
  ra_drop_on_trusted_port          0
  ra_recd_on_untrusted_port        0
  rr_recd_on_trusted_port          0
  rr_recd_on_untrusted_port        0
  ns_recd_on_trusted_port          0
  ns_recd_on_untrusted_port        0
  ns_failed_mac_check              0
  ns_failed_prefix_check           0
  ns_failed_binding_limit          0
  ns_failed_nd_snoop_validation    0
  na_recd_on_trusted_port          0
  na_recd_on_untrusted_port        0
  na_failed_mac_check              0
  na_failed_prefix_check           0
  na_failed_binding_limit          0
  na_failed_nd_snoop_validation    0
  nd_invalid_packet_received       0
  total_nd_packets_dropped         0
  Pkts_to_refilter_interface       0
  Pkts_on_vxlan_tunnels_received     0
  Pkts_on_vxlan_tunnels_sent         0
  Pkts_on_vxlan_tunnels_dropped      0

Feature ipsavvxlan:
 Source IP            = 2.2.2.2
 VXLAN Socket         = 29

Feature remote-ipbinding:

Feature ipbinding:
  Storage                    =  DISABLED


Total count of lockdown entries = 0
Total count of IPv6 lockdown entries = 0


Displaying lease entries with (vid,mac) as key.
Total number of entries: 0
Leased IPv6 addr  MAC                 Vid    Switch port  Lease time   Server IPv6
address IS_STATIC Lockdown
```

```
----------------  ------------------  -----  ------------ -----------  -----------
-------- --------- --------
2000::2           11:22:32:44:55:66   1      1/1/1        195          0
        0         Yes
2000::1           11:22:33:44:55:66   1      1/1/1        211          0
        0         Yes

Displaying lease entries with (vid,ip) as key.
Total number of entries: 0
Leased IPv6 addr  MAC                 Vid    Switch port  Lease time   Server IPv6
address IS_STATIC Lockdown
----------------  ------------------  -----  ------------ -----------  -----------
-------- --------- --------
2000::2           11:22:32:44:55:66   1      1/1/1        195          0
        0         Yes
2000::1           11:22:33:44:55:66   1      1/1/1        211          0
        0         Yes


Feature ipsavmac:

Feature ipsavvlan:
Vlan ID  State    VNI      Port map
-------  -------  -------- --------
1        ENABLE   -        1 420
7        ENABLE   100      3,4
100      ENABLE   -        1

Feature ipsavport:
ISL Port Name   =
 Index       = 0
 Egress blocked port map     = None
 IPv6 Lockdown vidmap        =

Port Name  Index  Socket  Trusted  Max Binding  Lockdown  VID map
---------  -----  ------  -------  -----------  --------  -------
1/1/10     10     26      No       16384        No        1
1/1/8      8      30      No       16384        No        1
1/1/26     26     22      No       16384        No        1
1/1/27     27     23      No       16384        No        1
1/1/14     14     19      No       16384        No        1
1/1/25     25     32      No       16384        No        1
1/1/17     17     43      No       16384        No        1
1/1/18     18     42      No       16384        No        1
1/1/28     28     16      No       16384        No        1
1/1/23     23     28      No       16384        No        1
1/1/24     24     18      No       16384        No        1
1/1/11     11     34      No       16384        No        1
1/1/13     13     25      No       16384        No        1
1/1/16     16     36      No       16384        No        1
1/1/22     22     35      No       16384        No        1
1/1/5      5      40      No       16384        No        1
1/1/9      9      20      No       16384        No        1
1/1/12     12     38      No       16384        No        1
1/1/15     15     39      No       16384        No        1
1/1/20     20     29      No       16384        No        1
1/1/4      4      41      No       16384        No        1
1/1/7      7      37      No       16384        No        1
1/1/21     21     33      No       16384        No        1
1/1/1      1      17      No       16384        No        1
1/1/6      6      27      No       16384        No        1
1/1/19     19     24      No       16384        No        1
```

```
1/1/2      2      31      Yes      16384        No         1
1/1/3      3      21      No       16384        No         1


Feature ipsav:

    * nd-snooping *
 VID map            = 1
 Global Config      = ENABLED
 State              = ENABLED




-------------------------------------------------------------------------
[End] Daemon ipsavd
-------------------------------------------------------------------------
=========================================================================
[End] Feature nd-snooping
=========================================================================
Diagnostic-dump captured for feature nd-snooping
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

nd-snooping

```
nd-snooping {enable|disable}
no nd-snooping {enable|disable}
```

Description

Enables or disables ND snooping. ND snooping is disabled by default. ND snooping is not supported on the management interface.

Examples

Enabling ND snooping:

```
switch(config)# nd-snooping enable
```

Disabling ND snooping:

```
switch(config)# nd-snooping disable
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

nd-snooping (in config-vlan context)

```
nd-snooping
no nd-snooping
```

Description

Enables ND snooping in the **config-vlan** context. ND snooping is disabled by default for all VLANs.

The no form of the command disables ND snooping on the specified VLAN, flushing all the IPv6 bindings learned for this VLAN since ND snooping was enabled for this VLAN.

Examples

Enabling ND snooping on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# nd-snooping
switch(config-vlan-100)# exit
switch(config)#
```

Disabling ND snooping on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# no nd-snooping
switch(config-vlan-100)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan`	Administrators or local user group members with execution rights for this command.

nd-snooping mac-check

```
nd-snooping mac-check
no nd-snooping mac-check
```

Description

This command enables verification of the hardware address field in ND snooping packets. When enabled, the ICMPv6 target link layer address field and the source MAC address must be the same for packets received on untrusted ports or else the packets are dropped. This ND snooping MAC verification is enabled by default.

The no form of the command disables ND snooping MAC verification.

Examples

Enabling ND snooping MAC verification:

```
switch(config)# nd-snooping mac-check
```

Disabling ND snooping MAC verification:

```
switch(config)# no nd-snooping mac-check
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

nd-snooping prefix-list

```
nd-snooping prefix-list <IPV6-ADDR>
no nd-snooping prefix-list <IPV6-ADDR>
```

Description

Configures the ND snooping prefix list for the selected VLAN and the specified IPv6 address prefix. ND snooping must be enabled both globally and on this VLAN before this prefix list configuration takes effect.

The no form of this command removes the prefix list configuration for the selected VLAN and IPv6 address.

Parameter	Description
<IPV6-ADDR>	Specifies the IPv6 address.

Examples

Configuring ND snooping prefix-list on VLAN 1:

```
switch(config)# vlan 1
switch(config-vlan-1)# nd-snooping prefix-list 2001::1/64
switch(config-vlan-1)# exit
switch(config)#
```

Remove configuration of ND snooping prefix-list on VLAN 100:

```
switch(config)# vlan 1
switch(config-vlan-1)# no nd-snooping prefix-list 2001::1/64
switch(config-vlan-1)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan-<VLAN-ID>`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

nd-snooping max-bindings

```
nd-snooping max-bindings <MAX-BINDINGS>
no nd-snooping max-bindings
```

Description

Sets the maximum number of ND bindings allowed on the selected interface. For all interfaces on which this command is not run, the default max bindings applies.

The no form of the command reverts max bindings for the selected interface to its default.

Parameter	Description
<MAX-BINDINGS>	Specifies the maximum number of ND bindings. You can use the **show capacities** command to see the maximum available for your switch model.

Examples

On the 6400 Switch Series, interface identification differs.

Set the ND max bindings to 768 on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# nd-snooping max-bindings 768
switch(config-if)# exit
switch(config)#
```

Revert ND max bindings to its default on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# no nd-snooping max-bindings
switch(config-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

nd-snooping nd-guard

```
nd-snooping nd-guard
no nd-snooping nd-guard
```

Description

This command enables ND guard on the selected VLAN.

The no form of the command disables ND guard and deletes all the IPv6 bindings learned on the VLAN.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

Examples

Enabling ND snooping ND guard on VLAN 100:

```
switch(config)# nd-snooping enable
switch(config)# vlan 100
switch(config-vlan-100)# nd-snooping nd-guard
switch(config-vlan-100)# exit
switch(config)#
```

Disabling ND snooping ND guard on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# no nd-snooping nd-guard
switch(config-vlan-100)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan`	Administrators or local user group members with execution rights for this command.

nd-snooping ra-guard

```
nd-snooping ra-guard [log]
no nd-snooping ra-guard
```

Description

This command enables Routing Advertisement (RA) guard on the selected VLAN. When enabled, ingress Routing Advertisement (RA) and Routing Redirect (RR) packets on the selected VLAN are blocked on untrusted ports. The packets are forwarded when received on trusted ports.

The no form of the command disables RA guard on the VLAN.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

Parameter	Description
`[log]`	Logs messages along with drop functionality.

Examples

Enabling ND snooping RA guard on VLAN 100:

```
switch(config)# nd-snooping enable
switch(config)# vlan 100
switch(config-vlan-100)# nd-snooping ra-guard
switch(config-vlan-100)# exit
switch(config)#
```

Enabling ND snooping RA guard on VLAN 100 with event logging on dropped packets:

```
switch(config)# nd-snooping enable
switch(config)# vlan 100
switch(config-vlan-100)# nd-snooping ra-guard log
switch(config-vlan-100)# exit
switch(config)#
```

Disabling ND snooping RA guard on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# no nd-snooping ra-guard
switch(config-vlan-100)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

nd-snooping ra-drop

```
nd-snooping ra-drop
no nd-snooping ra-drop
```

Description

This command enables Routing Advertisement (RA) drop on the selected VLAN. When enabled, ingress RA packets on the selected VLAN are blocked on both trusted and untrusted ports. When disabled, RA packets are forwarded on the selected VLAN with ND snooping trusted port validation. RA drop is disabled by default.

ND snooping must be enabled in both the config context and the config-vlan context before this command can be used.

The no form of the command disables ND snooping RA drop on the selected VLAN.

Examples

Enabling ND snooping RA drop on VLAN 100:

```
switch(config)# nd-snooping enable vlan 100
switch(config-vlan-100)# nd-snooping ra-drop
switch(config-vlan-100)# exit
switch(config)#
```

Disabling ND snooping RA drop on VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan-100)# no nd-snooping ra-drop
switch(config-vlan-100)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

nd-snooping trust

```
nd-snooping trust
no nd-snooping trust
```

Description

Enables ND snooping trust on the selected interface (port). Only server packets received on trusted ports are forwarded. All the ports are untrusted by default.

The no form of the command disables ND snooping trust on the selected port.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling ND snooping trust on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# nd-snooping trust
switch(config-if)# exit
switch(config)#
```

Disabling ND snooping trust on interface 2/2/1:

```
switch(config)# interface 2/2/1
switch(config-if)# no nd-snooping trust
switch(config-if)# exit
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show nd-snooping

`show nd-snooping [vlan <VLAN-ID>] [vsx-peer]`

Description

Shows either all ND snooping configuration or the configuration for the specified VLAN.

Parameter	Description
`vlan <VLAN-ID>`	Specifies the VLAN for which the ND configuration is to be shown. Range: 1 to 4094.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not

Parameter	Description
	have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

(Applies to the 6200, 6300, 6400, 8100, and 8360.) Showing all ND snooping configuration:

```
switch(config)# show nd-snooping

  ND Snooping Information
  ========================

  ND Snooping                         : Enabled
  ND Snooping Enabled VLANs           : 10
  Trusted Port Bindings Enabled VLANs : 10
  ND Guard Enabled VLANs              : 10
  RA Guard Enabled VLANs              : 10
  RA Drop Enabled VLANs               :
  MAC Address Check                   : Disabled

  PORT    TRUST  MAX-BINDINGS  CURRENT-BINDINGS
  ------- ------ ------------- -----------------
  1/1/1   Yes
  1/1/2   Yes
  1/1/3   No     100           10
  1/1/4   No     200           10
  1/1/5   No     300           10
```

(Applies to the 6200, 6300, 6400, 8100, 8360.) Showing ND snooping configuration for VLAN 2:

```
switch(config)# show nd-snooping vlan 2

  ND Snooping Information
  =======================

  ND Snooping           : Enabled
  MAC Address Check     : Disabled
  Trusted Port Bindings : Enabled
  ND Guard              : Enabled
  RA Guard              : Disabled
  RA Drop               : Disabled

  PORT    TRUST  MAX-BINDINGS  CURRENT-BINDINGS
  ------- ------ ------------- -----------------
  1/1/1   Yes
  1/1/2   Yes
  1/1/3   No     100           10
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show nd-snooping binding

```
show nd-snooping bindings [vsx-peer]
```

Description

Shows the ND snooping binding configuration.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing the ND snooping binding configuration:

```
switch# show nd-snooping binding

  PORT    IPV6-ADDRESS                             MAC-ADDRESS        VLAN  TIME-
LEFT STATE
  ------- ---------------------------------------- ------------------ ----- ------
--- ---------
  1/1/1   2001::1                                  00:00:0A:01:02:03  1     600
   Valid
  1/1/2   fe80::250:56ff:fe9a:143c                 00:00:0B:01:02:03  2     -
   Tentative
  1/1/3   2001:1111:2222:3333:4444:5555:6666:7777  00:00:0C:01:02:03  4094  -
   Testing
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show nd-snooping prefix-list

```
show nd-snooping prefix-list [vsx-peer]
```

Description

Shows the ND snooping prefix list information.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing the ND snooping prefix list information:

```
switch# show nd-snooping prefix-list

  VLAN  IPV6-ADDRESS-PREFIX                          SOURCE
  ----- -------------------------------------------- --------
  1     2001::/64                                    Static
  4094  3001::/64                                    Dynamic
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show nd-snooping statistics

```
show nd-snooping statistics [vsx-peer]
```

Description

Shows the global ND snooping statistics.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

(Applies to the 6200, 6300, 6400, 8100, 8360.) Showing global ND snooping statistics:

```
switch(config)# show nd-snooping statistics

  PACKET-TYPE  ACTION   REASON                                          COUNT
  ------------ -------- ----------------------------------------------- --------
  RA           forward  RA packets received on trusted port              20
  RA           drop     RA packets received on untrusted port            45
  NS           forward  NS packets received on trusted port              52
  NS           forward  NS packets received on untrusted port            95
  NS           drop     NS packets failed MAC check                      14
  NS           drop     NS packets failed Prefix check                   12
  NS           drop     NS packets failed on max-binding limit           0
  NS           drop     NS packets failed ND snooping validation checks  20
  NA           forward  NA packets received on trusted port              17
  NA           forward  NA packets received on untrusted port            30
  NA           drop     NA packets failed Prefix check                   15
  NA           drop     NA packets failed on max-binding limit           2
  NA           drop     NA packets failed ND snooping validation checks  5
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 95

Network Analytics Engine commands

nae cli-authorization

```
nae cli-authorization
no nae cli-authorization
```

Description

Configures the NAE agent action CLI commands to require authorization. By default, the NAE agent action CLI commands are subject to regular command authorization, including when TACACS+ is configured for authorization. Unless the configured authorization method allows the CLI commands sent by the NAE agent as user admin, the NAE agent action CLI commands will result in command failures.

The **no** form of the command disables the authorization required for NAE agent action CLI commands.

Examples

Enabling authorization requirement for NAE agent action CLI commands:

```
switch(config)# nae cli-authorization
```

Disabling authorization requirement for NAE agent action CLI commands:

```
switch(config)# no nae cli-authorization
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show nae-agent

```
show nae-agent [<AGENT-NAME>] [vsx-peer]
```

Description

Shows the details of the NAE Agent. If the agent name is specified, then shows the information details of the specified agent.

Parameter	Description
<AGENT-NAME>	Specifies the name of the agent. Length: 3 to 80 alphanumeric characters, including underscore (_).
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

The output of this command shows the following information about the Aruba Network Analytics Engine agents that are configured and enabled on the switch:

Parameter	Description
Agent Name	The name of the agent. Length: 3 through 80 characters.
Script Name	The name of the script. Length: 3 through 80 characters. Example: **memory_monitor**
Version	The version number of the script.
Origin	The origin of the script: ▪ system: Indicates that the script is provided as part of the system software. ▪ user: Indicates that a user loaded the script. ▪ generated: Indicates that the agent is configured using the CLI.
Disabled	Indicates whether the agent is disabled or enabled on the switch: ▪ true: Indicates that the agent is disabled. ▪ false: Indicates that the agent is enabled on the switch.
Status	The current state of the agent. Status values are the following: ▪ CRITICAL :The agent has encountered a critical error during execution. For information about the error, see the Analytics Dashboard of the Web UI. ▪ MAJOR: The agent has encountered a major error during execution. For information about the error, see the Analytics Dashboard of the Web UI. ▪ MINOR: The agent has encountered a minor error during execution. For information about the error, see the Analytics Dashboard of the Web UI. ▪ NORMAL: Indicates that the agent is actively monitoring network conditions and handling events.
Time series count	Number of time series associated with agent.
Alerts count	Number of alerts generated by the agent.

Parameter	Description
Rules	Number of Prometheus rules associated with the agent.
Error	Current error state of the agent.
Recent alerts	Lists the recent alerts.

Example

Showing the details of all the NAE agents existing in the switch:

```
switch# show nae-agent
----------------------------------------------------------------------------------
--------------------------------------------------------------------------
Agent Name                           Script Name                      Version
Origin    Disabled  Status    Time Series Count   Alerts Count  Rules  Error
----------------------------------------------------------------------------------
--------------------------------------------------------------------------
com.arubanetworks.monitor.agent       com.arubanetworks.monitor       1.0
user      true      UNKNOWN   0                   0             0      NONE
interface_monitor.agent               interface_tx_rx_stats_monitor   2.3
user      true      UNKNOWN   168                 10            36     NONE
com.arubanetworks.wildcard.vlan.agent com.arubanetworks.wildcard.vlan 1.0
user      false     UNKNOWN   0                   0             0      ERROR
system_resource_monitor.default       system_resource_monitor         1.3
system    false     NORMAL    6                   23            10     NONE
event_monitor                         event_monitor                   NA
generated NA        NA        0                   0             0      Script
activation is pending
cpu_monitor                           cpu_monitor                     NA
generated NA        NA        0                   0             0      Script
generation is in progress
mem_monitor                           mem_monitor                     NA
generated NA        NA        0                   0             0      Script
validation is in progress
interface_monitor                     interface_monitor               NA
generated NA        NA        0                   0             0      Agent
creation is in progress
port_monitor                          port_monitor                    NA
generated NA        NA        0                   0             0      Agent
updation is in progress
```

Showing the details of the NAE agent named **memory_monitor**:

```
switch# show nae-agent memory_monitor
Script Name       : memory_monitor
Version           : 1.0
Origin            : generated
Disabled          : false
Status            : NORMAL
Time Series Count : 0
Alerts Count      : 0
Rules             : 0
Error             : None
Alert Description : Memory - Normal
Recent alerts     :
       <1> 2021-05-29 01:34:11 An action has been triggered by NAE agent memory_monitor
       <2> 2021-05-28 06:11:00 An action has been triggered by NAE agent memory_monitor
```

```
         <3> 2021-05-27 03:19:50 An action has been triggered by NAE agent memory_monitor
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.13.1000	Command output updated to display **Alert Description** for the agent name.
10.09	Added *<AGENT-NAME>*
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

show nae-agent alerts

`show nae-agent [<AGENT-NAME>] alerts`

Shows the alerts raised by all the NAE agents. If the agent name is specified, then shows the alerts raised by the specified agent.

Parameter	Description
<AGENT-NAME>	Specifies the name of the NAE-Lite agent.

Example

Showing the alerts raised by all the NAE agents:

```
switch# show nae-agent alerts
2021-06-13 07:53:56 An action has been triggered by NAE agent memory_monitor
2021-06-07 00:30:10 An action has been triggered by NAE agent system_resource_
monitor.default
2021-06-07 00:24:13 An action has been triggered by NAE agent system_resource_
monitor.default
2021-06-06 21:48:27 An action has been triggered by NAE agent memory_monitor
2021-06-06 18:44:41 An action has been triggered by NAE agent system_resource_
monitor.default
2021-06-06 18:31:53 An action has been triggered by NAE agent system_resource_
monitor.default
2021-06-06 20:19:03 An action has been triggered by NAE agent system_resource_
```

```
monitor.default
2021-06-06 20:15:05 An action has been triggered by NAE agent system_resource_
monitor.default
2021-06-03 07:45:36 An action has been triggered by NAE agent memory_monitor
```

Showing the alerts raised by the NAE agent named **memory_monitor**:

```
switch# show nae-agent memory_monitor alerts
2021-06-13 07:54:47 An action has been triggered by NAE agent memory_monitor
2021-06-13 07:53:56 An action has been triggered by NAE agent memory_monitor
2021-06-06 21:48:27 An action has been triggered by NAE agent memory_monitor
2021-06-03 07:45:36 An action has been triggered by NAE agent memory_monitor
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

show nae-agent alerts details

```
show nae-agent [<AGENT-NAME>] alerts details [<INSTANCE-ID>]
```

Description

Shows the detailed information of a specific NAE agent alert raised by all the NAE agents.

Only CLI, alert, and system log specific action details are displayed as the output. For other action details, refer to the Web UI.

Parameter	Description
<AGENT-NAME>	Specifies the name of the NAE-Lite agent. Length: 3 to 80 alphanumeric characters, including underscore (_).
<INSTANCE-ID>	Specifies the instance of the alert. Number **1** represents the latest alert whereas **N** represents the Nth recent alert. By default, it displays the latest alert (*INSTANCE-ID*=1).

Example

Showing the details of the recent alert of the NAE-Lite agent named **memory_monitor**:

```
switch# show nae-agent memory_monitor alerts details 1
2Alert Message: 2021-06-13 07:54:47 An action has been triggered by NAE agent
memory_monitor
Action(s) performed: Alert, CLI, Syslog

Action Details:
===============
Action Alert: Alert level changed to MAJOR
Action Syslog: Potential mis-configuration detected
Action CLI:
6405# top cpu
top - 07:54:27 up 25 min,  1 user,  load average: 10.45, 10.38, 8.48
Tasks: 295 total,   1 running, 294 sleeping,   0 stopped,   0 zombie
%Cpu(s):  2.2 us,  2.2 sy,  0.0 ni, 95.7 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   7555.6 total,   1982.1 free,   2022.6 used,   3550.9 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   5307.9 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
  27776 admin     20   0    3540   2128   1580 R  16.7   0.0   0:00.04
/usr/bin/top -b -n 2 -c -o %CPU -w 11+
      1 root      20   0   14272   9468   5260 S   0.0   0.1   0:03.23 /sbin/init
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 [kthreadd]
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 [rcu_gp]

Only the action Alert, action Syslog, and action CLI details are displayed in this
command.
Please refer to the Web UI for other action details.
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

show nae-script

```
show nae-script [vsx-peer]
```

Description

Shows information about the Aruba Network Analytics Engine scripts that are available on the switch.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

This command shows the following information about the Aruba Network Analytics Engine scripts that are available on the switch:

Script Name

The name of the script. Length: 3 through 80 characters.

Example: **system_resource_monitor_mm1.default**

Version

The version number of the script.

Origin

The origin of the script:

`system`

Indicates that the script is provided as part of the system software.

`user`

Indicates that a user loaded the script.

Status

The current state of the script. Status values are the following:

`CREATED`

The script has been uploaded to the switch, but script validation has not begun.

`ERROR`

The script validation process detected an error that would result in execution errors if an agent runs the script. Resolve the error by modifying the script. For information about the error, see the **Analytics Dashboard** of the Web UI.

`VALIDATING`

The script syntax and components (manifest, parameters, monitor, condition, and action) are in the process of being validated.

`VALIDATED`

The script syntax and components (manifest, parameters, monitor, condition, and action) have been validated and no errors have been found.

Example

```
switch# show nae-script
---------------------------------------------------------------------
Script Name                            Version   Origin    Status
---------------------------------------------------------------------
fan_monitor                            1.0       system    VALIDATED
interface_link_flap_monitor            1.0       system    VALIDATED
interface_link_state_monitor           1.0       system    VALIDATED
interface_tx_rx_stats_monitor          1.0       system    VALIDATED
lag_imbalance_monitor                  1.0       system    VALIDATED
lag_status_monitor                     1.0       system    VALIDATED
power_supply_monitor                   1.0       system    VALIDATED
stp_bpdu_tcn_rate_monitor              1.0       system    VALIDATED
system_resource_monitor_mm1.default    1.0       system    VALIDATED
```

```
system_resource_monitor_mm2.default    1.0       system    VALIDATED
temp_sensor_monitor                    1.0       system    VALIDATED
---------------------------------------------------------------------
Script Name                            Version   Origin    Status
---------------------------------------------------------------------
fan_monitor                            1.0       system    VALIDATED
interface_link_flap_monitor            1.0       system    VALIDATED
interface_link_state_monitor           1.0       system    VALIDATED
interface_tx_rx_stats_monitor          1.0       system    VALIDATED
lag_imbalance_monitor                  1.0       system    VALIDATED
lag_status_monitor                     1.0       system    VALIDATED
power_supply_monitor                   1.0       system    VALIDATED
stp_bpdu_tcn_rate_monitor              1.0       system    VALIDATED
system_resource_monitor_mm1.default    1.0       system    VALIDATED
system_resource_monitor_mm2.default    1.0       system    VALIDATED
temp_sensor_monitor                    1.0       system    VALIDATED
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

uerieshow running-config (nae-lite)

`show running-config`

Description

Shows the NAE-Lite running configuration.

Example

Showing the NAE-Lite running configuration:

```
switch# show running-config
Current configuration:
!
!Version Halon 0.1.0 (Build: ridley-Halon-0.1.0-master-20161110190644-dev)
!Schema version 0.1.8
hostname switch
...
nae-agent memory_monitor
```

~~~~
    desc Memory resource monitor
    monitor memory system memory line-module 1/3
    set-condition monitor memory gt 80
        status major
        syslog "High memory usage detected"
        cli show system
        clear-condition monitor memory lt 40
            status normal
            syslog "Memory usage is recovered to normal limit"
exit
nae-agent crash_watch
    desc Watch the crash event
    tags crash, resource
    watch crash_event event-log 1201
    set-condition watch event-log crash_event
        status major
        cli show core-dump all
exit
nae-agent crash_watch activate
nae-agent memory_monitor activate
...
```
~~~~

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

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Network Analytics Engine Lite commands

actions

```
status {normal | minor | major | critical}
no status {normal | minor | major | critical}

syslog <MESSAGE> [facility {kern | user | mail | daemon | auth | syslog |
     lpr | uucp | authpriv | cron | ftp}]
     [severity {debug | info | notice | warning | err | crit | alert | emer}]
no syslog <MESSAGE> [facility {kern | user | mail | daemon | auth | syslog |
     lpr | uucp | authpriv | cron | ftp}]
     [severity {debug | info | notice | warning | err | crit | alert | emer}]

cli <COMMAND> {show system | redirect local-file} {show version | redirect tftp}
no cli <COMMAND>

schedule <SCHEDULE>
no schedule <SCHEDULE>

trap <TRAP>
no trap <TRAP>
```

Description

Configures different NAE-Lite agent actions to be performed when the set condition or the clear condition is met. The following NAE actions can be configured for the set and clear condition:

status—Set the alert level for the NAE-Lite Agent.

syslog—Create a syslog message and send it to the configured remote syslog servers.

cli—Execute a CLI command. Multiple CLI commands can be specified by using **\n** as the delimiter.

schedule—Execute a configured job CLI commands at the specific time.

trap—Create a snmp trap message and send it to the configured snmp servers.

The **no** form of this command removes the actions associated with the NAE-Lite agent condition.

Parameter	Description
`normal`	Sets the NAE-Lite agent status to **normal** (default).
`minor`	Sets the NAE-Lite agent status to **minor**.
`major`	Sets the NAE-Lite agent status to **major**.
`critical`	Sets the NAE-Lite agent status to **critical**.
<MESSAGE	Specifies the syslog message to be sent when the set condition or the clear condition is met. Length: 3 to 255 characters.

Parameter	Description
`facility {kern | user | mail | daemon | auth | syslog | lpr | uucp | authpriv | cron | ftp}`	Specifies the syslog facility code to denote the type of program that is logging the message. The default facility code is daemon. Optional. The valid facility code values are: ■ **kern**: Sets the syslog message source as kernel. ■ **user**: Sets the syslog message source as user space programs. ■ **mail**: Sets the syslog message source as mail system. ■ **daemon**: Sets the syslog message source as system daemon (default). ■ **auth**: Sets the syslog message source as authentication subsystem. ■ **syslog**: Sets the syslog message source as syslog daemon. ■ **lpr**: Sets the syslog message source as line printer subsystem. ■ **uucp**: Sets the syslog message source as unix-to-unix copy subsystem. ■ **authpriv**: Sets the syslog message source as security subsystem. ■ **cron**: Sets the syslog message source as cron scheduler subsystem. ■ **ftp**: Sets the syslog message source as FTP daemon.
`[severity {debug | info | notice | warning | err | crit | alert | emer}]`	Specifies the severity level for the syslog message. The severity level values are: ■ **debug**: Sets the syslog severity level as **debug**. ■ **info**: Sets the syslog severity as **information** (default). ■ **notice**: Sets the syslog severity as **notice**. ■ **warning**: Sets the syslog severity as **warning**. ■ **err**: Sets the syslog severity as **error**. ■ **crit**: Sets the syslog severity as **critical**. ■ **alert**: Sets the syslog severity as **alert**. ■ **emer**: Sets the syslog severity as **emergency**.
<COMMAND>	Specifies the CLI command to be executed when the set condition or the clear condition is met.
`{show system | redirect local-file}`	Specifies where to relocate local-file.
`{show version | redirect tftp}`	Specifies where to relocate tftp.

Usage

Take note of the following requirements and recommendations:

- SNMP trap messages should be a minimum of 3 and a maximum of 255 characters.
- Add the job configuration separately in the configuration node and execute the corresponding job name in the action schedule CLI.

- It is not recommended to use NAE-lite action schedule CLI commands in the NAE-lite action CLI.
- It is not recommended to add the job configuration CLI and schedule configuration CLI together in the action schedule CLI.

Example

Setting the status level for the NAE-Lite agent condition:

```
switch(config-nae-agent-condition)# status major
```

Creating the syslog message for the NAE-Lite agent condition:

```
switch(config-nae-agent-condition)# syslog "IPSLA server1 is down" severity err
```

Executing the CLI command for the NAE-Lite agent condition:

```
switch(config-nae-agent-condition)# cli show version\nshow image
```

Removing the different actions associated with the NAE-Lite agent condition:

```
switch(config-nae-agent-condition)# no status minor
```

```
switch(config-nae-agent-condition)# no syslog "Processing system event"
```

```
switch(config-nae-agent-condition)# no cli show logging
```

Executing the schedule CLI command:

```
switch(config-nae-agent-condition)# schedule
SCHEDULE  Set the job schedule CLI command. The CLI commands can be specified by
using `\n` as the separator.
```

Example of a scheduled CLI Command:

```
switch(config-nae-agent-condition)# schedule s1\n10 job j1\ntrigger every minutes
30 start 17:20 2023-11-21
```

Creating the snmp trap message:

```
switch(config-nae-agent-condition)# trap
TRAP      Set the trap message
```

Example of a trap message:

```
switch(config-nae-agent-condition)# trap High system CPU utilization
```

Removing the scheduled CLI command:

```
switch(config-nae-agent)# no schedule
```

Removing snmp trap message:

```
switch(config-nae-agent)# no trap
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.14	**Schedule** and **Trap** actions introduced.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-nae-agent-condition`	Administrators or local user group members with execution rights for this command.

desc

```
desc <DESCRIPTION>
no desc <DESCRIPTION>
```

Description

Adds the description for the NAE-Lite agent.

The **no** form of this command removes the description from the NAE-Lite agent.

Parameter	Description
<DESCRIPTION>	Specifies the description for the NAE-Lite agent. Range: 3 to 255 characters

Example

Adding the description for the NAE-Lite agent:

```
switch(config-nae-agent)# desc Monitor system memory
```

Removing the description for the NAE-Lite agent:

```
switch(config-nae-agent)# no desc Monitor system memory
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-nae-agent`	Administrators or local user group members with execution rights for this command.

disable

```
disable
no disable
```

Description

Disables the NAE-lite agent. The NAE-Lite agents are enabled by default.

The **no** form of this command enables the NAE-Lite agent.

Example

Disabling the NAE-Lite agent:

```
switch(config-nae-agent)# disable
```

Enabling the NAE-Lite agent:

```
switch(config-nae-agent)# no disable
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-nae-agent`	Administrators or local user group members with execution rights for this command.

monitor resource

```
monitor <MONITOR-NAME> resource <RESOURCE> [group-by {count | sum | min | max | average}
[over {seconds | minutes | hours | days} <DURATION>]]
no monitor <MONITOR-NAME> resource <RESOURCE> [group-by {count | sum | min | max |
average} [over {seconds | minutes | hours | days} <DURATION>]]

monitor <MONITOR-NAME> resource <RESOURCE> group-by rate over {seconds | minutes | hours
| days} <DURATION>
no monitor <MONITOR-NAME> resource <RESOURCE> group-by rate over {seconds | minutes |
hours | days} <DURATION>
```

Description

Configures the monitor for the NAE-Lite agent. The monitor defines what system resource the agent must monitor. Monitors are defined using the time series function and it supports the grouping of data.

The **no** form of this command removes the monitor associated with the NAE-Lite agent. Before removing the monitor, you must remove the condition used in the monitor.

Parameter	Description
<MONITOR-NAME>	Specifies the name of the monitor. Length: 3 to 80 alphanumeric characters, including underscore (_).
<RESOURCE> The *<RESOURCE>* is defined as follows: ■ For 8400 and 6400 Switch Series: ○ `system {cpu | memory} {management-module | line-module} <SLOT-ID>` ○ `system storage {nos | security | coredump | logs | selftest} management-module <SLOT-ID>` ○ `system storage coredump line-module <SLOT-ID>` ■ For 6300 and 6200 Switch Series: ○ `system {cpu | memory} vsf member <MEMBER-ID>` ○ `system storage {nos | security | coredump | logs | selftest} vsf member <MEMBER-ID>`	Specifies the system resources such as memory, CPU, and storage utilization for specific modules that need to be monitored. Values are: ■ **cpu**: Configures the CPU monitoring. ■ **memory**: Configures the memory monitoring. ■ **storage**: Configures the storage utilization monitoring. ■ **management-module**: Monitors resources of the management module. ■ **line-module**: Monitors resources of the line module. ■ nos: Monitors the network operating system storage utilization. ■ **security**: Monitors the security storage utilization.

Parameter	Description
	- **coredump**: Monitors the coredump storage utilization. - **logs**: Monitors the log storage utilization. - **selftest**: Monitors the self-test storage utilization. - **<SLOT-ID>**: Configure the module slot ID. **<SLOT-ID>** is the mandatory parameter for representing the management module or line module. - **vsf member *<MEMBER-ID>***: Configures the VSF member ID. The member ID is the mandatory parameter.
`group-by {count | sum | min | max | average}`	Groups the monitored data based on the parameters specified. Values are: - **count**: Groups by distinct counts of monitored data. - **sum**: Groups by summing the monitored data. - **min**: Groups by minimum value of the monitored data. - **max**: Groups the data by maximum value of the monitored data. - **average**: Groups by average value of the monitored data.
`over {seconds | minutes | hours | days} <DURATION>`	Group over the specified time interval in the past instead of the current value. Values are: **seconds**: Sets the time interval in seconds. Range: 5 to 10000 **minutes**: Sets the time interval in minutes. Range: 1 to 10000. **hours**: Sets the time interval in hours. Range: 1 to 10000. **days**: Sets the time interval in days. Range: 1 to 365.
`rate over {seconds | minutes | hours | days} <DURATION>`	Groups by rate of change of the monitored data over the specified time interval.

Example

Configuring the monitor for the **system cpu** resource on the **1/1** module (8400 and 6400 Switch Series):

```
switch(config-nae-agent)# monitor sys_cpu resource system cpu management-module
1/1
```

Configuring the monitor for the calculating the average CPU usage over the 30 minutes (8400 and 6400 Switch Series):

```
switch(config-nae-agent)# monitor avg_sys_cpu resource system cpu line-module 1/4
group-by average over minutes 30
```

Configuring the monitor for the system CPU usage on the **vsf member 1** (6300 and 6200 Switch Series):

```
switch(config-nae-agent)# monitor sys_cpu resource system cpu vsf member 1
```

Removing the monitor named **sys_mem**:

```
switch(config-nae-agent)# no monitor sys_mem
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-nae-agent`	Administrators or local user group members with execution rights for this command.

nae-agent lite

```
nae-agent lite <AGENT-NAME>
no nae-agent lite [<AGENT-NAME>]
```

Description

Configures the NAE-Lite agent. After the command is executed, the command prompt enters into the **nae-agent** context. The specified name of the agent is also used as the name of the NAE script generated from the agent configurations. Therefore the agent name must be unique and must not match with any existing NAE scripts or NAE-Lite agent names.

The **no** form of the command removes the NAE-Lite agent configuration. The **no nae-agent lite** command removes all the configured NAE-Lite agents.

Parameter	Description
<AGENT-NAME>	Specifies the name of the NAE-Lite agent. Length: 3 to 80 alphanumeric characters, including underscore (_).

Example

Configuring NAE-Lite agent named **mem_monitor** and entering into the **nae-agent** context:

```
switch(config)# nae-agent lite mem_monitor
switch(config-nae-agent)#
```

Removing the NAE-Lite agent named **mem_monitor**:

```
switch(config-nae-agent)# no nae-agent lite mem_monitor
```

Removing all the NAE-Lite agent configurations:

```
switch(config)# no nae-agent lite
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

nae-agent lite activate

```
nae-agent lite <AGENT-NAME> activate
no nae-agent lite <AGENT-NAME> activate
```

Description

Activates the NAE-Lite agent creation. Once activated, the NAE-Lite agent gets generated, validated, and begins monitoring.

Whenever modifying the NAE-Lite agent configuration, after all the modifications are done, you must trigger the agent update process by executing **no nae-agent lite <*AGENT-NAME*> activate** followed by **nae-agent lite <*AGENT-NAME*> activate**. The agent will not be created or updated until the **nae-agent lite <*AGENT-NAME*> activate** command is executed.

The **no** form of the command deactivates the NAE-Lite agent. Once the command is executed, the NAE-Lite agent and its corresponding script will be deleted.

Parameter	Description
<AGENT-NAME>	Specifies the name of the NAE-Lite agent. Length: 3 to 80 alphanumeric characters, including underscore (_).

Example

Activating the NAE-Lite agent named **crash_watch** :

```
switch(config)# nae-agent lite crash_watch activate
```

Deactivating the NAE-Lite agent named **mem_monitor** :

```
switch(config)# no nae-agent lite mem_monitor activate
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

2set-condition monitor

```
set-condition monitor <MONITOR-NAME> {{lt | le | eq | ne | gt | ge} <VALUE>[for {seconds
| minutes | hours | days} <DURATION>] | transition from <STRING-LIST> to <STRING-LIST>}
no set-condition monitor <MONITOR-NAME> {{lt | le | eq | ne | gt | ge} <VALUE> [for
{seconds | minutes | hours | days} <DURATION>] | transition from <STRING-LIST> to
<STRING-LIST>}

clear-condition monitor <MONITOR-NAME> {{lt | le | eq | ne | gt | ge} <VALUE> [for
{seconds | minutes | hours | days} <DURATION>] | transition from <STRING-LIST> to
<STRING-LIST>}
```

```
no clear-condition monitor <MONITOR-NAME> {{lt | le | eq | ne | gt | ge} <VALUE> [for
{seconds | minutes | hours | days} <DURATION>] | transition from <STRING-LIST> to
<STRING-LIST>}
```

Description

Defines the condition for the monitor resource events. Once the condition is met, one or more actions are executed based on the configuration.

The clear condition is an optional component of the condition and helps in identifying if an event, usually an issue in the system, is no longer occurring. Clear conditions also address the problem when data is fluctuating above and below the threshold, generating too many alerts. Initially, when an NAE-Lite agent is created, only the set-condition is active. Once the set-condition is met, the condition becomes inactive and the clear condition becomes active. The set-condition becomes active again once the clear condition is met.

The **no** form of this command removes the monitor condition associated with the NAE-Lite agent.

Parameter	Description
<MONITOR-NAME>	Specifies the monitor name used in the condition.
<VALUE>	Specifies the numeric value compared with the monitor value. The defined values are: ■ lt (less than) ■ le (less than or equal to) ■ eq (equal to) ■ ne (not equal to) ■ gt (greater than) ■ ge (greater than or equal to) ■ transition
<DURATION>	Specifies the time duration. The defined time duration are: ■ seconds (Range: 5-10000) ■ minutes (Range: 1-10000) ■ hours (Range: 1-10000) ■ day
<STRING-LIST>	Specifies the list of one or more strings representing the initial or final value of the monitor. The strings are comma-separated and each string must be contained within double-quotes.

Example

Configuring set conditions for the NAE-Lite agent:

```
switch(config-nae-agent)# set-condition monitor average_mem gt 70
```

Configuring the set and clear conditions for the NAE-Lite agent:

```
switch(config-nae-agent)# set-condition monitor cpu gt 70 for minutes 30
switch(config-nae-agent-condition)# clear-condition monitor cpu lt 30 for minutes
30
```

```
switch(config-nae-agent)# set-condition monitor line_mdl_state transition from
"ready" to "down","error"
switch(config-nae-agent-condition)# clear-condition monitor line_mdl_state
transition from "down","error" to "ready"
```

Removing the monitor conditions for the NAE-Lite agent:

```
switch(config-nae-agent)# no set-condition monitor line_mdl_state transition from
"ready" to "down","error"
```

```
switch(config-nae-agent-condition)# no clear-condition monitor cpu lt 30 for
minutes 30
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	config-nae-agent config-nae-agent-condition	Administrators or local user group members with execution rights for this command.

5set-condition watch

```
set-condition watch event-log <WATCH-NAME> [include {all | any} <REGEX-LIST>] [exclude
<REGEX-LIST>] [count <COUNT>]
no set-condition watch event-log <WATCH-NAME> [include {all | any} <REGEX-LIST>] [exclude
<REGEX-LIST>] [count <COUNT>]

clear-condition watch event-log <WATCH-NAME> [include {all | any} <REGEX-LIST>] [exclude
<REGEX-LIST>] [count <COUNT>]
no clear-condition watch event-log <WATCH-NAME> [include {all | any} <REGEX-LIST>]
[exclude <REGEX-LIST>] [count <COUNT>]
```

Description

Defines the condition for the watch resource events. Once the condition is met, one or more actions are executed based on the configuration.

The clear condition is an optional component of the condition and helps in identifying an event, usually an issue in the system, is no longer occurring. Clear conditions also address the problem when data is fluctuating above and below the threshold, and generating too many alerts. Initially, when an NAE-Lite agent is created, only the set-condition is active. Once the set-condition is met, the condition becomes inactive and the clear condition becomes active. The set-condition becomes active again once the clear condition is met.

The condition is met when any of the event logs watched by the **<WATCH-NAME>** has occurred and the event log message fits the include or exclude **<REGEX-LIST>** (if configured) and the condition has occurred for **<COUNT>** number of times (if configured).

The **no** form of this command removes the condition associated with the NAE-Lite agent.

Parameter	Description
<WATCH-NAME>	Specifies the name of the watch. This must be already defined using the watch command.
include {all | any} *<REGEX-LIST>*	Configures the list of strings matching the regular expression that must be included in the event log message. Optional.
all	Includes all of the specified lists of regular expressions in event-log messages.
any	Includes any of the specified lists of regular expressions in event-log messages
<REGEX-LIST>	Specifies the comma-separated list of one or more regular expressions that must be matched against the event log messages. Optional.
exclude	Configures the list of strings matching the regular expression that must be included in the event log message. Optional.
count *<COUNT>*	Limits the number of times that the condition to be met once in every specified count. Optional. For example, if you want to monitor mac movement in the VLAN for every 10**th** time, then the count must be specified as 10. Range: 1 to 4294967295.

Example

Defining the condition for the watch named **ipsla_status** including all the specified list:

```
switch(config-nae-agent)# set-condition watch event-log ipsla_status
include all "servername","failure" count 3
```

Clearing the condition for the watch named **ipsla_status** including all the specified list:

```
switch(config-nae-agent-condition)# clear-condition watch ipsla_status
include all "servername","success"
```

Defining the condition for the watch named **ipsla_status** excluding **snmpd**:

```
switch(config-nae-agent-condition)# set-condition watch event-log crash_event
exclude snmpd
```

Removing the conditions associated with the NAE-Lite agent:

```
switch(config-nae-agent)# no set-condition watch event-log ipsla_status  include
all "servername","failure"
```

```
switch(config-nae-agent-condition)# no clear-condition watch ipsla_status
include all "servername","success"
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	config-nae-agent config-nae-agent-condition	Administrators or local user group members with execution rights for this command.

show running-config nae-agent

```
show running-config nae-agent
```

Description

Shows the NAE-Lite agent current running configurations.

Example

Showing the NAE-Lite running configurations:

```
switch# show running-config nae-agent
Current configuration:
!
...
nae-agent lite memory_monitor
    desc Memory resource monitor
    monitor memory system memory line-module 1/3
    set-condition monitor memory gt 80
        status major
        syslog "High memory usage detected"
        cli show system
        clear-condition monitor memory lt 40
            status normal
            syslog "Memory usage is recovered to normal limit"

nae-agent lite crash_watch
```

~~~
    desc Watch the crash event
    tags crash, resource
    watch crash_event event-log 1201
    set-condition watch event-log crash_event
        status major
        cli show core-dump all
nae-agent lite crash_watch activate
nae-agent lite memory_monitor activate
...
```
~~~

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

tags

```
tags <TAG-LIST>
no tags <TAG-LIST>
```

Description

Configures the tags applicable for the NAE-Lite agent. The tags are used to categorize and group the agent.

The **no** form of this command removes the tag lists associated with the NAE-Lite agent.

Parameter	Description
<TAG-LIST>	Specifies the tag list for the NAE-Lite agent.*<TAG-LIST>* is the comma separated list of tags. Each tag can be a minimum of 3 to a maximum of 32 characters in length. A maximum of 16 tags are supported.

Example

Configuring the tags for the NAE-Lite agent:

```
switch(config-nae-agent)# tags memory,resource,ztag
```

Removing the tags for the NAE-Lite agent:

```
switch(config-nae-agent)# no tags
```

```
switch(config-nae-agent)# no tags memory,resource
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-nae-agent`	Administrators or local user group members with execution rights for this command.

watch event-log

```
watch <WATCH-NAME> event-log <EVENT-ID-LIST>
no watch <WATCH-NAME> event-log <EVENT-ID-LIST>
```

Description

Configures the watch source for the NAE-Lite agent. This enables the agent to watch for specific events occurring in the system. Event-driven monitoring can be performed by watching the event log of the system.

For information on event IDs, refer to the Event Log Message Reference Guide.

The **no** form of this command removes the watch associated with the NAE-Lite agent.

Parameter	Description
<WATCH-NAME>	Specifies the watch name for the NAE-Lite agent. Length: 3 to 80 alphanumeric characters, including underscore (_).
<EVENT-ID-LIST>	Specifies the list of one or more event IDs of the event log message. A maximum of five event IDs can be specified.

Example

Configuring the watch source for the NAE-Lite agent.

```
switch(config-nae-agent)# watch crash_event event-log 1201
```

Removing the watch source used by the NAE-Lite agent:

```
switch(config-nae-agent)# no watch high_mem
```

```
switch(config-nae-agent)# no watch high_mem_event event-log 1208,1209
```

For more information on features that use this command, refer to the Network Analytics Engine Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-nae-agent`	Administrators or local user group members with execution rights for this command.

Chapter 97

Network configuration validation commands

switch config-validator

```
switch config-validator [config <CONFIG-NAME>] [feature <feature>] [mode {consistency |
vsx-sync}] [format {cli | json}]
```

`mode vsx-sync` is not supported on the 6300 switch series.

Description

Runs configuration validation to detect configuration anomalies.

Parameter	Description
config	Specifies configuration to be validated. The default configuration is **running-config**.
feature <feature>	Specifies the name of the feature to be validated. **NOTE:** Available features vary by switch type. The 6300 Series Switch supports **vsf** as an option for the **feature** parameter, and the 6400 Series Switch supports **vsx** as an option for the **feature** parameter.
mode	Specifies configuration validation mode. The default is **consistency**.
consistency	Validates feature configuration for consistency check.
vsx-sync	Validates VSX configuration synchronization between VSX peers for VSX enabled features. **vsx-sync** is not supported on the 6300 switch series.
format	Specifies the results display format. The default is **cli**.

Examples

Running configuration validation with all default values. (6300 Switch Series)

```
switch# switch config-validator
Line number 15: Split detect (MAD) is recommended for vsf stack.
Line number 18: VSF interface should be configured in the VSF link and the
interface should be up.
Line number 34: Configuration 'associate role <ROLE_NAME> is missing.
Line number 38: Configuration 'enable' is recommended.
Line number 43: Configuration 'enable' is recommended.
Line number 45: A group (LLDP, CDP, MAC) should be associated with only one device
profile.
```

Running configuration validation with switches for the vsx feature. (6400 Switch Series)

```
switch (config)# switch config-validator config running-config feature vsx
Line number 36: Configuration `system-mac <VSX_SYSTEM_MAC>` is recommended
Line number 36: Multi chassis configuration is recommended for VSX redundancy
```

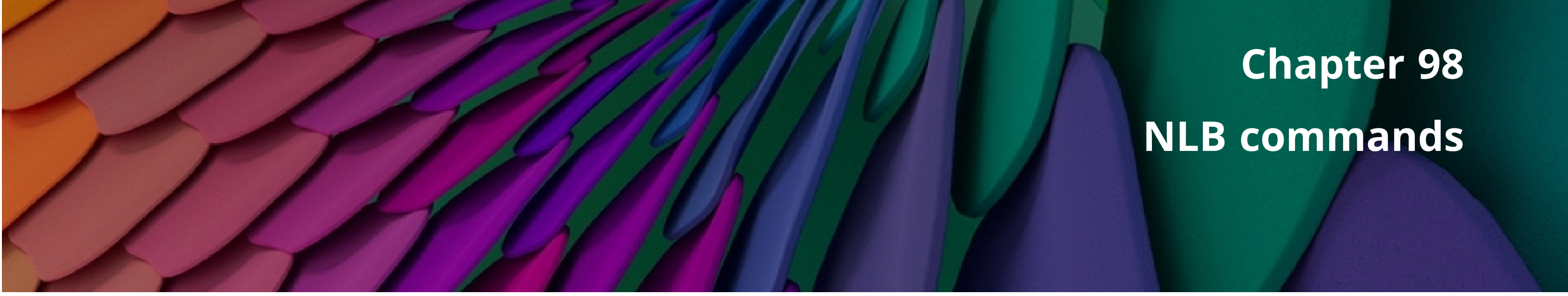
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 98

NLB commands

arp ip mac

```
arp ip <IP-ADDR> mac <MAC-ADDR>
no arp ip <IP-ADDR> mac <MAC-ADDR>
```

Description

Configures static ARP multicast on the interface.

The **no** form of this command removes the static ARP multicast configuration.

Parameter	Description
<IP-ADDR>	Specifies cluster's virtual IPv4 address.
<MAC-ADDR>	Specifies multicast MAC address in IANA format (xx:xx:xx:xx:xx:xx) and non IANA format (xxxx.xxxx.xxxx).

Examples

Configuring static ARP multicast on an interface:

```
switch(config)# vlan 10
switch(config-vlan-10)# no shutdown
switch(config-vlan-10)# ip igmp snooping enable
switch(config-vlan-10)# exit
switch(config)# interface vlan10
switch(config-if-vlan)# ip igmp enable
switch(config-if-vlan)# arp ip 10.1.30.254 mac 01:00:5e:7F:1E:FE
```

If your NLB Virtual IP address is 10.1.30.254, then the server will join the 239.255.30.254 IGMP group. This IGMP group is mapped to the destination MAC address of 01:00:5e:7F:1E:FE.

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.14	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.

Release	Modification
10.08	Added NLB support for 6300 and 6400 Switch series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` and `config-if-vlan`	Administrators or local user group members with execution rights for this command.

show arp

```
show arp
```

Description

Displays the static ARP multicast information.

Examples

Displaying the static ARP multicast information:

```
switch# show arp

IPv4 Address     MAC                Port         Physical Port    State
---------------------------------------------------------------------------
3.3.3.3          01:00:5e:00:00:02               1/1/1            permanent
2.2.2.2          01:00:5e:00:00:01  vlan10                        permanent

Total Number Of ARP Entries Listed- 2.
---------------------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.08	Added NLB support for 6300 and 6400 Switch series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show ip igmp snooping vlan group

`show ip igmp snooping vlan <VLAN-ID> group IGMP-Group`

Description

Displays multicast joins (members of the cluster) participating in the IGMP group.

Examples

Displaying multicast joins participating in the IGMP group:

```
switch# show ip igmp snooping vlan 10 group 239.255.30.254

VLAN ID   : 10
VLAN Name : VLAN10

Group Address : 239.255.30.254
Last Reporter : 10.1.30.254
Group Type    : Filter

                                        V1        V2        Sources   Sources
Port      Vers Mode Uptime    Expires   Timer     Timer     Forwarded Blocked
--------- ---- ---- --------- --------- --------- --------- --------- --------
1/1/6     2    EXC  0m 21s    1m 12s              2m 48s    0         0
```

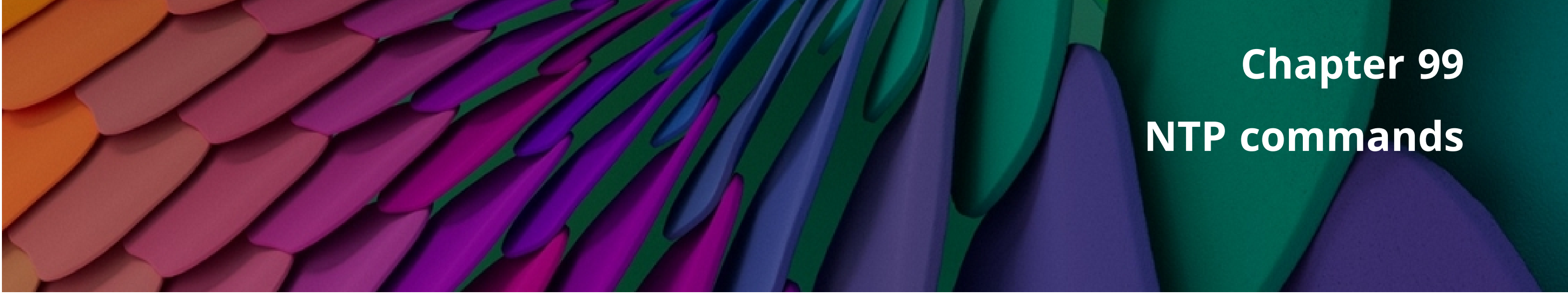
For more information on features that use this command, refer to the IP Services Guide for your switch model.

Command History

Release	Modification
10.08	Added NLB support for 6300 and 6400 Switch series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.



Chapter 99

NTP commands

ntp authentication

```
ntp authentication
no ntp authentication
```

Description

Enables support for authentication when communicating with an NTP server.

The **no** form of this command disables authentication support.

Examples

Enabling authentication support:

```
switch(config)# ntp authentication
```

Disabling authentication support:

```
switch(config)# no ntp authentication
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ntp authentication-key

```
ntp authentication-key <KEY-ID> {md5 | sha1}
    [{ <PLAINTXT-KEY> [trusted] | ciphertext <ENCRYPTED-KEY> }]
no ntp authentication-key <KEY-ID>  {md5 | sha1}
    [{ <PLAINTXT-KEY> [trusted] | ciphertext <ENCRYPTED-KEY> }]
```

Description

Defines an authentication key that is used to secure the exchange with an NTP time server. This command provides protection against accidentally synchronizing to a time source that is not trusted.

The **no** form of this command removes the authentication key.

Parameter	Description
<KEY-ID>	Specifies the authentication key ID. Range: 1 to 65534.
`md5`	Selects MD5 key encryption.
`sha1`	Specifies SHA1 key encryption.
<PLAINTXT-KEY>	Specifies the plaintext authentication key. Range: 8 to 40 characters. The key may contain printable ASCII characters excluding "#" or be entered in hex. Keys longer than 20 characters are assumed to be hex. To use an ASCII key longer than 20 characters, convert it to hex.
`trusted`	Specifies that this is a trusted key. When NTP authentication is enabled, the switch only synchronizes with time servers that transmit packets containing a trusted key.
`ciphertext` *<ENCRYPTED-KEY>*	Specifies the ciphertext authentication key in Base64 format. This is used to restore the NTP authentication key when copying configuration files between switches or when uploading a previously saved configuration. **NOTE:** When the key is not provided on the command line, plaintext key prompting occurs upon pressing Enter, followed by prompting as to whether the key is to be trusted. The entered key characters are masked with asterisks.

Examples

Defining key 10 with MD5 encryption and a provided plaintext trusted key:

```
switch(config)# ntp authentication-key 10 md5 F82#450b trusted
```

Defining key 5 with SHA1 encryption and a prompted plaintext trusted key:

```
switch(config)# ntp authentication-key 5 sha1
Enter the NTP authentication key: *********
Re-Enter the NTP authentication key: *********

Configure the key as trusted (y/n)? y
```

Removing key 10:

```
switch(config)# no ntp authentication-key 10
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ntp disable

```
ntp disable
```

Description

Disables the NTP client on the switch. The NTP client is disabled by default.

Examples

Disabling the NTP client.

```
switch(config)# ntp disable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ntp enable

```
ntp enable
```

```
no ntp enable
```

Description

Enables the NTP client on the switch to automatically adjust the local time and date on the switch. The NTP client is disabled by default.

The **no** form of this command disables the NTP client.

Examples

Enabling the NTP client.

```
switch(config)# ntp enable
```

Disabling the NTP client.

```
switch(config)# no ntp enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ntp conductor

```
ntp conductor vrf <VRF-NAME> [stratum <NUMBER>]
no ntp conductor vrf <VRF-NAME> [stratum <NUMBER>]
```

Description

Sets the switch as the conductor time source for NTP clients on the specified VRF. By default, the switch operates at stratum level 8. The switch cannot function as both NTP conductor and client on the same VRF.

The **no** form of this command stops the switch from operating as the conductor time source on the specified VRF.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the VRF on which to act as conductor time source.
`stratum <NUMBER>`	Specifies the stratum level at which the switch operates. Range: 1 - 15. Default: 8.

Examples

Setting the switch to act as conductor time source on VRF **primary-vrf** with a stratum level of **9**.

```
switch(config)# ntp conductor vrf primary-vry statum 9
```

Stops the switch from acting as conductor time source on VRF **primary-vrf**.

```
switch(config)# no ntp conductor vrf primary-vry
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Inclusive language.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

ntp server

```
ntp server <IP-ADDR> [key <KEY-NUM>] [minpoll <MIN-NUM>] [maxpoll <MAX-NUM>][burst |
iburst][prefer] [version <VER-NUM>]
no ntp server <IP-ADDR> <IP-ADDR> [key <KEY-NUM>] [minpoll <MIN-NUM>] [maxpoll <MAX-NUM>]
[burst | iburst] [prefer] [version <VER-NUM>]
```

Description

Defines an NTP server to use for time synchronization, or updates the settings of an existing server with new values. Up to eight servers can be defined.

The **no** form of this command removes a configured NTP server.

The default NTP version is 4; it is backwards compatible with version 3.

Parameter	Description
`server <IP-ADDR>`	Specifies the address of an NTP server as a DNS name, an IPv4 address (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or an IPv6 address (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. When specifying an IPv4 address, you can remove leading zeros. For example, the address **192.169.005.100** becomes **192.168.5.100**. When specifying an IPv6 address, you can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a hextet of four zeros to a single 0. For example, this address **2222:0000:3333:0000:0000:0000:4444:0055** becomes **2222:0:3333::4444:55** .
`key <KEY-NUM>`	Specifies the key to use when communicating with the server. A trusted key must be defined with the command **ntp authentication-key** and authentication must be enabled with the command **ntp authentication**. Range: 1 to 65534.
`minpoll <MIN-NUM>`	Specifies the minimum polling interval in seconds, as a power of 2. Range: 4 to 17. Default: 6 (64 seconds).
`maxpoll <MAX-NUM>`	Specifies the maximum polling interval in seconds, as a power of 2. Range: 4 to 17. Default: 10 (1024 seconds).
`burst`	Send a burst of packets instead of just one when connected to the server. Useful for reducing phase noise when the polling interval is long.
`iburst`	Send a burst of six packets when not connected to the server. Useful for reducing synchronization time at startup.
`prefer`	Make this the preferred server.
`version <VER-NUM>`	Specifies the version number to use for all outgoing NTP packets. Range: 3 or 4. Default: 4. **NOTE:** NTP is backwards compatible.

Usage

For features such as Activate and ZTP, a switch that has a factory default configuration will automatically be configured with pool.ntp.org. NTP server configurations via DHCP options are supported. The DHCP server can be configured with maximum of two NTP server addresses which will be supported on the switch. Only IPV4 addresses are supported.

NTP uses a stratum to describe the distance between a network device and an authoritative time source:

- A stratum 1 time server is directly attached to an authoritative time source (such as a radio or atomic clock or a GPS time source).
- A stratum 2 NTP server receives its time through NTP from a stratum 1 time server.

When using multiple servers with same stratum setting, the best practice to configure a preferred server, so NTP will attempt to use the preferred server as the primary NTP connection. If a preferred server is not manually set when NTP is enabled, the configured server with the lowest stratum will automatically be set as the preferred server. If there are servers with the same stratum, this auto prefer status will prevent AOS-CX from toggling between different servers as the primary server. Auto prefer selection of servers with same stratum (if not manually selected) may change after reconfiguring the switch, or after executing the **reboot** command.

Examples

Defining the ntp server pool.ntp.org, using iburst, and NTP version 4.

```
switch(config)# ntp server pool.ntp.org iburst version 4
```

Removing the ntp server pool.ntp.org.

```
switch(config)# no ntp server pool.ntp.org
```

Defining the ntp server my-ntp.mydomain.com and makes it the preferred server.

```
switch(config)# ntp server my-ntp.mydomain.com prefer
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

ntp trusted-key

```
ntp trusted-key <KEY-ID>
no ntp trusted-key <KEY-ID>
```

Description

Sets a key as trusted. When NTP authentication is enabled, the switch only synchronizes with time servers that transmit packets containing a trusted key.

The **no** form of this command removes the trusted designation from a key.

Parameter	Description
<KEY-ID>	Specifies the identification number of the key to set as trusted. Range: 1 to 65534.

Examples

Defining key 10 as a trusted key.

```
switch(config)# ntp trusted-key 10
```

Removing trusted designation from key 10:

```
switch(config)# no ntp trusted-key 10
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config	Administrators or local user group members with execution rights for this command.

ntp vrf

```
ntp vrf <VRF-NAME>
no ntp vrf <VRF-NAME>
```

Description

Specifies the VRF on which the NTP client communicates with an NTP server. The switch cannot function as both NTP conductor and client on the same VRF.
The **no** form of the command returns to default VRF.

Parameter	Description
<VRF-NAME>	Specifies the name of a VRF.

Example

Setting the switch to use the default VRF for NTP client traffic.

```
switch(config)# ntp vrf default
```

Setting the switch to use the default management VRF for NTP client traffic.

Returning the switch to use the default VRF for NTP client traffic.

```
switch(config)# no ntp vrf
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

show ntp associations

```
show ntp associations [vsx-peer]
```

Description

Shows the status of the connection to each NTP server. The following information is displayed for each server:

- Tally code : The first character is the Tally code:
  - (blank): No state information available (e.g. non-responding server)
  - x : Out of tolerance (discarded by intersection algorithm)
  - . : Discarded by table overflow (not used)
  - - : Out of tolerance (discarded by the cluster algorithm)
  - + : Good and a preferred remote peer or server (included by the combine algorithm)
  - # : Good remote peer or server, but not utilized (ready as a backup source)
  - * : Remote peer or server presently used as a primary reference
  - o : PPS peer (when the prefer peer is valid)
- ID: Server number.
- NAME: NTP server FQDN/IP address (Only the first 24 characters of the name are displayed).
- REMOTE: Remote server IP address.
- REF_ID: Reference ID for the remote server (Can be an IP address).
- ST: (Stratum) Number of hops between the NTP client and the reference clock.
- LAST: Time since the last packet was received in seconds unless another unit is indicated.
- POLL: Interval (in seconds) between NTP poll packets. Maximum (1024) reached as server and client sync.
- REACH: 8-bit octal number that displays status of the last eight NTP messages (377 = all messages received).

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show ntp associations
----------------------------------------------------------------------
 ID            NAME          REMOTE          REF-ID ST LAST POLL REACH
----------------------------------------------------------------------
  1       192.0.1.1       192.0.1.1          .INIT. 16    -   64     0
* 2  time.apple.com    17.253.2.253          .GPSs.  2   70  128   377
----------------------------------------------------------------------
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ntp authentication-keys

```
show ntp authentication-keys [vsx-peer]
```

Description

Shows the currently defined authentication keys.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch# show ntp authentication-keys
--------------------------------
Auth key  Trusted   MD5 password
--------------------------------
 10          No     **********
 20         Yes     **********
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show ntp servers

`show ntp servers[vsx-peer]`

Description

Shows all configured NTP servers, including any DHCP servers, default pool servers or any server with the status **auto prefer**.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show ntp servers
------------------------------------------------
     NTP SERVER KEYID MINPOLL MAXPOLL OPTION VER
------------------------------------------------
     192.0.1.18     -       5      10 iburst   3
     192.0.1.19     -       6      10   none   4
     192.0.1.20     -       6       8  burst   3 prefer
------------------------------------------------
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ntp statistics

```
show ntp statistics [vsx-peer]
```

Description

Shows global NTP statistics. The following information is displayed:

- Rx-pkts: Total NTP packets received.
- Current Version Rx-pkts: Number of NTP packets that match the current NTP version.
- Old Version Rx-pkts: Number of NTP packets that match the previous NTP version.
- Error pkts: Packets dropped due to all other error reasons.
- Auth-failed pkts: Packets dropped due to authentication failure.
- Declined pkts: Packets denied access for any reason.
- Restricted pkts: Packets dropped due to NTP access control.
- Rate-limited pkts: Number of packets discarded due to rate limitation.
- KOD pkts: Number of Kiss of Death packets sent.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

```
switch(config)# show ntp statistics
                Rx-pkts 100
Current Version Rx-pkts 80
    Old Version Rx-pkts 20
               Err-pkts 2
```

```
       Auth-failed-pkts 1
          Declined-pkts 0
        Restricted-pkts 0
      Rate-limited-pkts 0
               KoD-pkts 0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ntp status

```
show ntp status [vsx-peer]
```

Description

Shows the status of NTP on the switch.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Displaying the status information when the switch is not synced to an NTP server:

```
switch# show ntp status
NTP is enabled.
NTP authentication is enabled.
NTP is using the default VRF for NTP server connections.

Wed Nov 23 23:29:10 PDT 2016
NTP uptime: 187 days, 1 hours, 37 minutes, 48 seconds

Not synchronized with an NTP server.
```

Displaying the status information when the switch is synced to an NTP server:

```
switch# show ntp status
NTP is enabled.
NTP authentication is enabled.
NTP is using the default VRF for NTP server connections.

Wed Nov 23 23:29:10 PDT 2016
NTP uptime: 187 days, 1 hours, 37 minutes, 48 seconds

Synchronized to NTP Server 17.253.2.253 at stratum 2.
Poll interval = 1024 seconds.
Time accuracy is within 0.994 seconds
Reference time: Thu Jan 28 2016 0:57:06.647 (UTC)
```

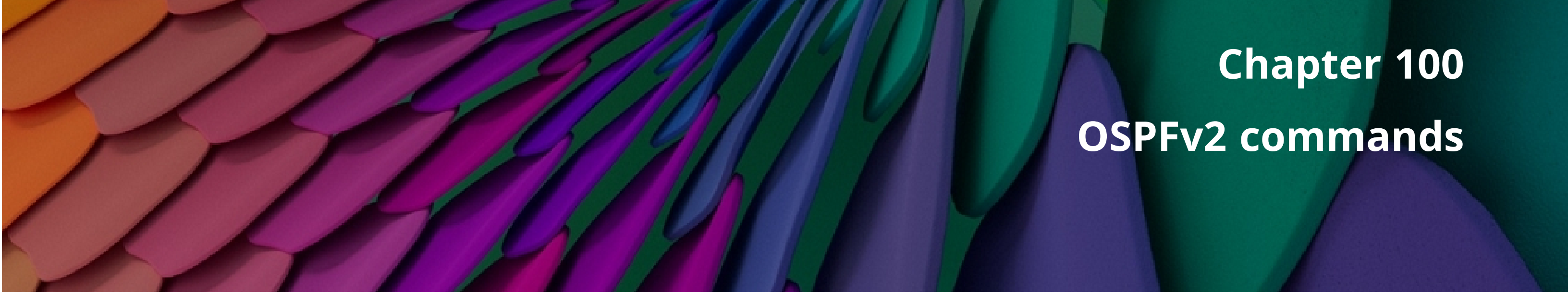
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 100
OSPFv2 commands

active-backbone

```
active-backbone stub-default-route
no active-backbone stub-default-route
```

Description

This command enables the router to send a default route to stub areas if there is an active loopback link in the backbone area. The configuration is not required if backbone area has neighbors or passive interfaces configured. By default active backbone detection is enabled.

Examples

```
switch(config)# router ospf 1
switch(config-ospf-1)# active-backbone stub-default-route
```

```
switch(config)# no active-backbone stub-default-route
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command Introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config-ospf-<PROCESS-ID>`
	`config-ospfv3-<PROCESS-ID>`
		Administrators or local user group members with execution rights for this command.

area (ospf)

```
area <AREA-ID>
no area <AREA-ID>
```

Description

Creates a normal area, with **<AREA-ID>** set if not present. If the area is already present and it is not a normal area, then this command changes the area type to normal.

The **no** form of this command deletes the area with the **<AREA-ID>** specified. Area can be of any type (nssa, nssa no-summary, stub, stub no-summary, and default normal area).

Parameter	Description
<AREA-ID>	Specifies the area ID in one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.

Examples

Creating a normal area:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 1
switch(config-ospf-1)# area 10.1.1.1
Switch(config-ospf-1)# show running-config current-context router ospf 1
       router-id 1.1.1.1
       area 0.0.0.0
       area 0.0.0.1
       area 0.0.0.2 stub
       area 0.0.0.3 nssa
```

Deleting an area:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no area 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area default-metric

```
area <AERA-ID> default-metric <COST>
no area <AREA-ID> default-metric
```

Description

Sets the cost of the default route announced to NSSA or stub areas.

The **no** form of this command resets the cost of the default route announced to NSSA or stub areas, to the default value of 1.

Parameter	Description
`<AREA-ID>`	Specifies area ID in one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
`default-metric <COST>`	Sets the cost of default-summary LSAs announced to NSSA or stub areas, to the specified value. Default cost: 1. Range: 0 to 16777215.

Examples

Setting cost for default LSA summary:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 1 default-metric 2
switch(config-ospf-1)# area 0.0.0.1 default-metric 2
```

Setting cost for default LSA summary to default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no area 1 default-metric
switch(config-ospf-1)# no area 0.0.0.1 default-metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area nssa

```
area <AREA-ID> nssa [no-summary]
no area <AREA-ID> nssa [no-summary]
```

Description

Creates the NSSA area (Not So Stubby Area) with **<AREA-ID>** if not present. If area is present and not NSSA area, this command changes the area type to NSSA area. If **no-summary** is used, area type will be NSSA No-Summary.

The **no** form of this command unsets the area type as NSSA. That is, the configured area will be changed to default normal area. The **no area <AREA-ID> nssa no-summary** command enables sending inter-area routes into NSSA, but will not unset the area as NSSA.

Parameter	Description
<AREA-ID>	Specifies the area ID in one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
`nssa [no-summary]`	Specifies Not So Stubby Area (NSSA) area type. If area is present and not NSSA area, parameter changes the area type to NSSA area. If **no-summary** is specified, area type will be NSSA No-Summary, which means do not inject inter-area routes into NSSA.

Examples

Creating an NSSA area:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 1 nssa
switch(config-ospf-1)# area 1 nssa no-summary
```

Unsetting the area as NSSA

```
switch(config)# router ospf 1
switch(config-ospf-1)# no area 1 nssa
switch(config-ospf-1)# no area 1 nssa no-summary
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-`*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

area range

```
area <AREA-ID> range <IP-PREFIX> type {inter-area | nssa} [no-advertise]
no area <AREA-ID> range <IP-PREFIX> type {inter-area | nssa} [no-advertise]
```

Description

Summarizes the routes with the matching address or masks. This command only works for border routers.

The **no** form of this command removes route summarization for the configured IPv4 prefix address on the ABR. When using the **no** form of the command with the **no-advertise** option, enables advertising this range to other areas.

Parameter	Description
<AREA-ID>	Specifies the area ID in one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
range *<IP-PREFIX>*	Specifies summarizing routes matching the area range prefix/mask.
type {inter-area | nssa}	Specifies the type this address aggregation applies to as either inter-area range prefix or NSSA range prefix.
no-advertise	Specifies the address range status as **DoNotAdvertise** (do not advertise this range to other areas).

Examples

Summarizing inter-area or NSSA paths:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 1
switch(config-ospf-1)# area 2 nssa
switch(config-ospf-1)# area 1 range 192.77.114.0/24 type inter-area
switch(config-ospf-1)# area 2 range 192.77.114.0/24 type nssa
switch(config-ospf-1)# area 2 range 192.77.114.0/24 type nssa no-advertise
```

Removing summarization:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no area 1 range 192.77.114.0/24 type inter-area
switch(config-ospf-1)# no area 2 range 192.77.114.0/24 type nssa
switch(config-ospf-1)# no area 2 range 192.77.114.0/24 type nssa no-advertise
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area stub

```
area <AREA-ID> stub [no-summary]
no area <AREA-ID> stub [no-summary]
```

Description

Creates the stub area with **<AREA-ID>** if not present. If the area is already present and it is not a normal stub area, then this command changes the stub area type to normal. If the **no-summary** parameter is used, area type will be stub No-Summary.

The **no** form of this command unsets the area as a stub type. That is, the configured area will be changed to a default normal area. The **no area <AREA-ID> stub no_summary** command enables sending inter-area routes into the stub area, but will not unset the area as stub.

ABR does not inject the default route in a Totally Stubby Area with loopback in Area 0.0.0.0. As a workaround, configure a passive interface or active neighbors in the backbone area.

Parameter	Description
<AREA-ID>	Specifies the area ID in one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
`stub [no-summary]`	Specifies the stub area type. If the area is already present and it is not a stub area, this parameter changes the area type to stub. If **no-summary** is specified, area type will be stub No-Summary (totally stubby area), which means do not inject summary link advertisements into stub areas.

Examples

Creating a STUB area:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 1 stub
switch(config-ospf-1)# area 1 stub no-summary
```

Unsetting the area type as stub:

```
switch(config)# router ospf 1
switch(config-ospf-1) # no area 1 stub
switch(config-ospf-1) # no area 1 sub no-summary
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area virtual-link

```
area <AREA-ID> virtual-link <ROUTER-ID>
no area <AREA-ID> virtual-link <ROUTER-ID>
```

Description

Creates an OSPF virtual link with a remote ABR and enters the vlink context.

The **no** form of this command deletes an OSPF virtual link with the specified router ID of the remote ABR. If no **<ROUTER-ID>** is specified, the **no** form of the command sets the virtual link to the default settings.

Parameter	Description
<AREA-ID>	Specifies the area ID in one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
`virtual-link <ROUTER-ID>`	Configures a virtual link with the specified router ID of the remote ABR.

Examples

Configuring OSPF virtual links:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)#
```

Deleting OSPF virtual links:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no area 100 virtual-link 100.0.1.1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

authentication

```
authentication {hmac-sha-1 | hmac-sha-256 | hmac-sha-384 | hmac-sha-512 | message-digest
| simple-text | null | keychain}
no authentication
```

Description

Sets the OSPF virtual-link authentication type that will be used for authentication with the remote ABR.

Choose one of the authentication types from the following parameters.

The **no** form of this command unconfigures the virtual-link authentication type used and sets it to Null authentication.

Parameter	Description
`hmac-sha-1`	Sets the authentication type as SHA-1.
`hmac-sha-256`	Sets the authentication type as SHA-256.
`hmac-sha-384`	Sets the authentication type as SHA-384.
`hmac-sha-512`	Sets the authentication type as SHA-512.
`message-digest`	Sets the authentication type to message-digest.
`simple-text`	Sets the authentication type to simple-text.
`null`	Sets the authentication type to null.
`keychain`	Sets authentication type to use the key chain.

Examples

Setting OSPF virtual links authentication type:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# authentication simple-text
```

Deleting OSPF virtual links authentication type:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no authentication
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

authentication-key

```
authentication-key [{ciphertext | plaintext} <PASSWORD>]
no authentication-key
```

Description

Sets the OSPF virtual-link authentication password that is used for simple-text authentication. If the password is given in ciphertext, it will be decrypted and applied to the protocol.

The **no** form of this command deletes the virtual-link authentication password that is used for simple-text authentication.

Parameter	Description
`{ciphertext | plaintext}`	Selects the password format.
<PASSWORD>	Specifies the password.

When the password is not provided on the command line, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

Examples

Setting the OSPF virtual link simple-text authentication password in plaintext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# authentication-key plaintext F82#450b
```

Setting the OSPF virtual link simple-text authentication with a prompted plaintext password:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# authentication-key
Enter the authentication key: ********
Re-Enter the authentication key: ********
```

Setting the OSPF virtual link simple-text authentication password in ciphertext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# authentication-key ciphertext AQaAz05...RmH+4pg=
```

Deleting the OSPF virtual link simple-text authentication password:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no authentication-key
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

clear ip ospf neighbors

```
clear ip ospf [<PROCESS-ID>] neighbor [<NEIGHBOR>] [interface [<INTERFACE-NAME>]]
[all-vrfs | vrf <VRF-NAME>]
```

Description

Resets the neighbor and clears the OSPF neighbor information.

Parameter	Description
<PROCESS-ID>	Specifies the OSPFv2 process ID to clear the statistics for the particular OSPFv2 process. Range: 1 to 65535.
<NEIGHBOR>	Specifies the router ID of a neighbor.
<INTERFACE-NAME>	Specifies the OSPFv2 statistics to clear for the specified interface.
all-vrfs	Select to clear the OSPFv2 statistics for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF.

Example

Clearing the OSPFv2 neighbor information:

```
switch# clear ip ospf 1 neighbor
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ip ospf 1 neighbor 1.1.1.2
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ip ospf 1 neighbor interface 1/1/1
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ip ospf 1 neighbor 1.1.1.5 vrf red
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ip ospf neighbor
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ip ospf neighbor 1.1.1.4
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ip ospf neighbor interface 1/1/1
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ip ospf neighbor 1.1.1.5 vrf red
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear ip ospf statistics

```
clear ip ospf [<PROCESS-ID>] statistics [interface [<INTERFACE-NAME>]] [all-vrfs | vrf
<VRF-NAME>]
```

Description

Clear the OSPF event statistics.

Parameter	Description
<PROCESS-ID>	OSPF process ID. Clear the statistics for the particular OSPF process. Range: 1 to 65535.
<INTERFACE-NAME>	Clear the OSPF statistics for the specified interface.
all-vrfs	Optionally select to clear the OSPF statistics for all VRFs.
vrf *<VRF-NAME>*	Optionally select to clear the OSPF statistics for a particular VRF. If the VRF is not specified, information for the default VRF is cleared.

Examples

Clearing the OSPF event statistics:

```
switch# clear ip ospf statistics
switch# clear ip ospf statistics interface 1/1/1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

dead-interval

```
dead-interval <INTERVAL>
no dead-interval
```

Description

Sets the interval after which a neighbor is declared dead if no hello packet comes in for virtual links.

The **no** form of this command sets the dead interval to default for virtual links. The default value is 40 seconds (generally four times the hello packet interval).

For proper operation, set the dead interval must be longer than the hello interval.

Parameter	Description
<INTERVAL>	Specifies the time interval for the dead interval, in seconds. Range: 1 to 65535. Default: 40.

Examples

Setting the OSPv2F virtual links dead interval:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# dead-interval 30
```

Setting the OSPFv2 virtual links dead interval to default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no dead-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

default-information originate

```
default-information originate [metric <METRIC-VALUE>]
```

```
no default-information originate [metric <METRIC-VALUE>]
```

Description

Configures OSPF to advertise the default route (0.0.0.0/0) to its neighbors if it is present in the routing table. Optionally, the metric value can be set for default route ::/0. The default value is 1.

The **no** form of this command disables advertisement of the default route.

Parameter	Description
metric <METRIC-VALUE>	Specifies the OSPF metric value for the default route. Optional. Default: 1.

Examples

Setting advertisement of the default route:

```
switch(config)# router ospf 1
switch(config-ospf-1)# default-information originate
```

Disabling advertisement of the default route:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no default-information originate
```

Setting advertisement of the default route and specifying an optional metric value of 20:

```
switch(config)# router ospf 1
switch(config-ospfv3-1)# default-information originate
switch(config-ospfv3-1)# default-information originate metric 20
```

Disabling advertisement of the default route and setting metric to the default value:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no default-information originate metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.09	Added parameter: **metric** <**METRIC-VALUE**>
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

default-information originate always

```
default-information originate always [metric <METRIC-VALUE>]
no default-information originate always [metric <METRIC-VALUE>]
```

Description

Configures OSPF to advertise the default route (0.0.0.0/0) to its neighbors, regardless if it is present in the routing table or not. Optionally, metric can be set for default route 0.0.0.0/0. The default value is 1.

The **no** form of this command disables advertisement of the default route.

Parameter	Description
metric <METRIC-VALUE>	Specifies the OSPF metric value for the default route. Default: 1.

Examples

Setting advertisement of the default route:

```
switch(config)# router ospf 1
switch(config-ospf-1)# default-information originate always
```

Disabling advertisement of the default route:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no default-information originate always
```

Setting advertisement of the default route with metric set to 20:

```
switch(config)# router ospf 1
switch(config-ospf-1)# default-information originate always metric 20
```

Disabling advertisement of the default route and setting the metric to the default value:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no default-information originate always metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.09	Added parameter: metric <**METRIC-VALUE**>
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

default-metric

```
default-metric <METRIC-VALUE>
no default-metric
```

Description

Sets the default metric for redistributed routes in the OSPF.

The **no** form of this command sets the default metric to be used for redistributed routes into OSPF to the default of 25.

Parameter	Description
<METRIC-VALUE>	Specifies the default metric value to use for redistributed routes. Default: 25. Range: 0-1677214.

Examples

Setting default metric for redistributed routes:

```
switch(config)# router ospf 1
switch(config-ospf-1)# default-metric 37
```

Setting default metric for redistributed routes to the default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no default-metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables the OSPF process.

This command does not remove the OSPF configurations.

Examples

Disabling OSPF process:

```
switch(config)# router ospf 1
switch(config-ospf-1)# disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

distance

```
distance [<DISTANCE-VAL> | intra-area [<DISTANCE-VAL>] | inter-area [<DISTANCE-VAL>] |
external [<DISTANCE-VAL>]]
no distance [intra-area | inter-area | external]
```

Description

Defines an Administrative Distance (AD) for OSPF. Administrative Distance is used as a criteria to select the best route when multiple routes are present from different routing protocols.

The **no** form of this command sets the OSPF administrative distance to the default of 110. Optionally, administrative distance can be set to default for the specific OSPF route type: intra-area, inter-area, or external type-5 and type-7 routes.

Parameter	Description
<DISTANCE-VAL>	Specifies the OSPF administrative distance. Range: 1 to 255. Default: 110.
intra-area	Specifies the OSPF distance for intra-area routes.
inter-area	Specifies the OSPF distance for inter-area routes.
external	Specifies the OSPF distance for external type 5 and type 7 routes.

Usage

Within a given OSPF process, intra-area routes are always given precedence even when distances are configured for inter-area or external type routes.

Examples

Setting OSPF administrative distance:

```
switch(config)# router ospf 1
switch(config-ospf-1)# distance 100
switch(config-ospf-1)# distance intra-area 24 external 55 inter-area 66
switch(config-ospf-1)# distance intra-area 24 external 55
switch(config-ospf-1)# distance external 55
switch(config-ospf-1)#exit

switch(config)# router ospf 2
switch(config-ospf-2)# distance 200
switch(config-ospf-2)# distance external 60
switch(config-ospf-2)# distance intra-area 24 inter-area 66
```

Setting OSPF administrative distance to the default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no distance
switch(config-ospf-1)# no distance external
switch(config-ospf-1)# no distance inter-area
switch(config-ospf-1)# no distance intra-area
switch(config-ospf-1)# no distance 100
switch(config-ospf-1)# no distance 220

switch(config)# router ospf 2 vrf blue
switch(config-ospf-2)# no distance 200
switch(config-ospf-2)# no distance external 60
switch(config-ospf-2)# no distance intra-area 24 inter-area 66
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Added capability to have individual admin distance for multiple OSPF processes in a VRF.

Release	Modification
10.09	Added parameters: **intra-area**, **inter-area**, **external**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

distribute-list prefix

```
distribute-list prefix <prefix-list-name> {in | out}
no distribute-list prefix <prefix-list-name> {in | out}
```

Description

This command uses an existing prefix list to filter routes that are being installed in the routing table or redistributed to another routing protocol.

The **distribute-list prefix** command filters routes in the inbound or the outbound direction. When this command is issued with the **in** parameter, it filters routes from being installed in the routing table, it does not filter LSAs. When this command is issued with the **out** parameter, it filters only the desired redistributed routes from other protocols.

This command requires that your prefix list is already defined using the ip prefix commands. Route-maps are not supported with the distribute-list feature.

Parameter	Description
`prefix <prefix-list-name>`	Specify the name of an existing prefix.
`{in | out}`	Select one of the following parameters to set the filter direction: ▪ **in**: Filter incoming routes into the routing table ▪ **out**: Filter outgoing routing updates

Examples

The following commands enable the filtering of OSPFv2 routes in an IPv4 network, so routes are no longer installed in the routing table or redistributed from another routing protocol.

```
switch(config)# router ospfv2 1
switch(config-ospfv2-1)# distribute-list prefix listA in
switch(config-ospfv2-1)# distribute-list prefix listB out
```

The following command disables the filtering of OSPFv2 routes in an IPv4 network, so routes can be installed in the routing table or redistributed from another routing protocol.

```
switch# configure terminal
switch(config)# router ospfv2 1
switch(config-ospfv2-1)# no distribute-list prefix listA in
switch(config-ospfv2-1)# no distribute-list prefix listB out
```

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv2-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables the OSPF process, if disabled. By default the OSPF process is enabled.

Examples

Enabling OSPF process:

```
switch(config)# router ospf 1
switch(config-ospf-1)# enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

graceful-restart

```
graceful-restart
   restart-interval <INTERVAL>
   helper [strict-lsa-check]
   ignore-lost-interface
   no...
```

Description

Configures graceful restart parameters for OSPF.

The **no** form of this command sets the restart interval to the default interval of 120 seconds or disables the helper mode, depending on the parameter specified.

Parameter	Description
`restart-interval <INTERVAL>`	Specifies the time another router waits for this router to gracefully restart and selects the maximum time to wait in seconds. Range: 5 to 1800. Default: 120.
`helper`	Specifies that the router will participate in the graceful restart of a neighbor router.
`strict-lsa-check`	(Optional). Use with the **helper** parameter to enable strict Link state Advertisement (LSA) checking when acting as a restart helper for a restarting peer. **NOTE:** OSPF neighbors must disable strict LSA checking. If the local node has fewer OSPF interfaces after restarting, then the neighbors that were adjacent on those interfaces will clear up their adjacencies to the restarting node and will send out link state updates to advertise the dropped adjacency. If strict LSA checking is enabled, the restarting router's neighbors will exit helper mode when they receive the updated LSAs and the graceful restart will still fail.
`ignore-lost-interface`	Enable the restarting router to ignore lost OSPF interfaces during a graceful restart process. This setting should be enabled on a high availability system to ensure a graceful restart completes successfully, even if OSPF-enabled links fail due to High Availability events like a switchover or failover. **NOTE:** Enabling this setting means that the hitless restart procedures do not strictly follow those defined in *RFC 3623, Graceful OSPF Restart*.
`no`	Negate any parameter or return the setting to its default.

Examples

Enabling OSPF graceful restart:

```
switch(config)# router ospf 1
switch(config-ospf-1)# graceful-restart restart-interval 40
switch(config-ospf-1)# graceful-restart helper strict-lsa-check
```

Enabling the switch to ignore lost OSPF interfaces during a graceful restart process:

```
switch(config)# router ospf 1
switch (config-ospf-1)# graceful-restart ignore-lost-interface
```

Setting the restart interval to default, and disabling helper mode:

```
switch(config)# router ospf 1
switch(config-ospfv3-1)# no graceful-restart restart-interval
switch(config-ospfv3-1)# no graceful-restart helper
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

hello-interval

```
hello-interval <INTERVAL>
no hello-interval
```

Description

Sets the time interval between OSPF hello packets for virtual links.

The **no** form of this command sets the hello interval to the default value of 10 seconds for virtual links.

For proper operation, the hello interval must be shorter than the dead interval.

Parameter	Description
<INTERVAL>	Specifies the time interval for the hello interval, in seconds. Range: 1 to 65535. Default: 10.

Examples

Setting the OSPF virtual links hello interval:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# hello-interval 30
```

Setting the OSPF virtual links hello interval to default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no hello-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

ip ospf area

```
ip ospf <PROCESS-ID> area <AREA-ID>
no ip ospf <PROCESS-ID> area <AREA-ID>
```

Description

Runs the OSPF protocol on the interface with the configured IPv4 address for the area specified. The interfaces which have an IP address configured in this network or in a subset of this network, will participate in the OSPF protocol.

To move an interface to a new area, unmap the existing area and then associate a new area with the interface.

The **no** form of this command disables OSPF on the interface and removes the interface from the area. Interfaces which have an IP address configured on the network or in a subset of the network, stop participating in the OSPF protocol.

Parameter	Description
<PROCESS-ID>	Specifies the OSPF process Id. Range: 1 to 65535.
<AREA-ID>	Specifies the OSPF area ID in one of the following formats. Area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. Area identifier in decimal format. Range: 0 to 4294967295.

Examples

Setting OSPF network for the area:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf 1 area 1
switch(config-if-vlan)# ip ospf 1 area 0.0.0.1
```

Disabling OSPF network for the area:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf 1 area 1
switch(config-if-vlan)# no ip ospf 1 area 0.0.0.1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf authentication

```
ip ospf authentication {message-digest | simple-text | null | keychain | hmac-sha-1 |
hmac-sha-256 | hmac-sha-384 | hmac-sha-512}
no ip ospf authentication
```

Description

Sets the authentication type that will be used for authentication with the neighbor router.

The **no** form of this command deletes the authentication type used for a particular authentication with the neighbor router and sets to null authentication.

Parameter	Description
`message-digest`	Sets authentication type as message-digest.
`simple-text`	Sets authentication type as simple-text.
`null`	Sets authentication type as null.
`keychain`	Sets the authentication type to use the key chain.
`hmac-sha-1`	Sets the authentication type to SHA-1.

Parameter	Description
`hmac-sha-256`	Sets the authentication type to SHA-256.
`hmac-sha-384`	Sets the authentication type to SHA-384.
`hmac-sha-512`	Sets the authentication type to SHA-512.

Examples

Setting OSPF authentication type on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf authentication simple-text
```

Deleting OSPF authentication type on the interface and sets it to null:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf authentication
```

Setting OSPF authentication type to SHA-384 on the interface:

```
switch(config)# interface vlan 5
switch(config-if-vlan)# ip ospf authentication hmac-sha-384
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ip ospf authentication-key

```
ip ospf authentication-key [{ciphertext | plaintext} <PASSWORD>]
no ip ospf authentication-key
```

Description

Sets the authentication password used for simple-text authentication. If the password is given in ciphertext it will be decrypted and applied to the protocol.

The **no** form of this command deletes the authentication password used for simple-text authentication.

Parameter	Description
`{ciphertext | plaintext}`	Selects the password format.
<PASSWORD>	Specifies the password.

When the password is not provided on the command line, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

Examples

Setting the OSPF simple-text authentication password in plaintext format:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf authentication-key plaintext F82#450b
```

Setting the OSPF simple-text authentication password with a prompted plaintext password:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf authentication-key
Enter the authentication key: ********
Re-Enter the authentication key: ********
```

Setting the OSPF simple-text authentication password in ciphertext format:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf authentication-key ciphertext AQBaZ...ecopg=
```

Deleting the OSPF simple-text authentication password:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf authentication-key
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf cost

```
ip ospf cost <INTERFACE-COST>
no ip ospf cost
```

Description

Sets the cost (metric) associated with a particular interface. The interface cost is used as a parameter to calculate the best routes.

The **no** form of this command sets the cost (metric) associated with a particular interface to the default cost 1.

Parameter	Description
<INTERFACE-COST>	Specifies the interface cost value. Range: 1 to 65535. Default: 1.

Examples

Setting OSPF interface cost

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf cost 100
```

Setting the OSPF interface cost to default

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf cost
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf dead-interval

```
ip ospf dead-interval <INTERVAL>
no ip ospf dead-interval
```

Description

Sets the interval after which a neighbor is declared dead if no hello packet is received on the OSPF interface.

The **no** form of this command sets the interval after which a neighbor is declared dead, to the default for the OSPF interface. The default value is 40 seconds (generally 4 times the hello packet interval).

Parameter	Description
<INTERVAL>	Specifies the time interval for the dead interval, in seconds. Range: 1 to 65535. Default: 40.

Examples

Setting OSPF dead interval on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf dead-interval 30
```

Setting OSPF dead interval to default on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf dead-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf hello-interval

```
ip ospf hello-interval <INTERVAL>
no ip ospf hello-interval
```

Description

Sets the time interval between OSPF hello packets for the OSPF interface.

The **no** form of this command sets the time interval OSPF hello packets to the default of 10 seconds for the OSPF interface.

Parameter	Description
<INTERVAL>	Specifies the time interval for the hello interval, in seconds. Range: 1 to 65535. Default: 10.

Examples

Setting OSPF hello interval on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf hello-interval 30
```

Setting OSPF hello interval to the default on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf hello-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if config-if-vlan	Administrators or local user group members with execution rights for this command.

ip ospf keychain

```
ip ospf keychain <KEYCHAIN-NAME>
no ip ospf keychain
```

Description

Sets the key chain for md5 authentication. A key chain configures rotating keys for packet authenticating, reducing the risk of keys being compromised.

The **no** form of this command deletes the key chain used for md5 authentication.

Parameter	Description
<KEYCHAIN-NAME>	Name of key chain to be used for md5 authentication.

Examples

Setting OSPFv2 key chain authentication:

```
switch(config)# interface 1/1/1
switch(config-if)# ip ospf keychain ospf_keys
```

Deleting OSPFv2 key chain authentication:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip ospf keychain
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

ip ospf message-digest-key md5

```
ip ospf message-digest-key <KEY-ID> md5 [{ciphertext | plaintext} <KEY>]
no ip ospf message-digest-key <KEY-ID>
```

Description

Sets the md5 message digest authentication key. If the md5 key is given in ciphertext, it will be decrypted and applied to the protocol.

The **no** form of this command deletes the md5 authentication key.

Parameter	Description
<KEY-ID>	Specifies the md5 key ID. Range: 1 to 255.
`{ciphertext | plaintext}`	Selects the md5 key format.
<KEY>	Specifies the md5 authentication key.

When the authentication key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting the md5 key in plaintext format:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf message-digest-key 1 md5 plaintext F82#450b
```

Setting the md5 key with a prompted plaintext key:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf message-digest-key 1 md5
Enter the MD5 authentication key: ********
Re-Enter the MD5 authentication key: ********
```

Setting the md5 key in ciphertext format:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf message-digest-key 1 md5 ciphertext AQt6e...7qEa4=
```

Deleting the md5 key:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf message-digest-key 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf network

```
ip ospf network {broadcast | point-to-point}
no ip ospf network
```

Description

Configures the OSPF network type for the interface. Choose one of the following parameters as the interface network type.

The **no** form of this command sets the network type for the interface to the system default which is broadcast network.

Parameter	Description
`broadcast`	Specifies the OSPF network type as a broadcast multi-access network.
`point-to-point`	Specifies the OSPF network type as a point-to-point network.

Examples

Setting OSPF network type for the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf network broadcast
switch(config-if-vlan)# ip ospf network point-to-point
```

Disabling OSPF network type for the interface to system default of broadcast network:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf network
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf passive

```
ip ospf passive
no ip ospf passive
```

Description

Configures the interface as an OSPF passive interface. With this setting, the interface participates in OSPF but does not send or receive packets on that interface.

The **no** form of this command resets the interface as active. With this setting, the interface starts sending and receiving OSPF packets.

Examples

Setting the interface as OSPF passive interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf passive
```

Setting the interface as OSPF active interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf passive
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf priority

```
ip ospf priority <PRIORITY-VALUE>
no ip ospf priority
```

Description

Sets the OSPF priority for the interface. The larger the numeric value of the priority, the higher the chances for it to become the designated router. Setting a priority of zero makes the router ineligible to become a designated router or back up designated router.

The **no** form of this command sets the OSPF priority for the interface to the default of 1.

Parameter	Description
<PRIORITY-VALUE>	Specifies the OSPF priority value. Range: 0 to 255. Default: 1.

Examples

Setting OSPF priority for the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf priority 50
```

Disabling OSPF priority for the interface to default:

```
switch(config)# interface vlan1
switch(config-if-vlan)# no ip ospf priority
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf retransmit-interval

```
ip ospf retransmit-interval <INTERVAL>
no ip ospf retransmit-interval
```

Description

Sets the time between retransmitting lost link state advertisements for the OSPF interface.

The **no** form of this command sets the time between retransmitting lost link state advertisements to the default of 5 seconds for the OSPF interface.

Parameter	Description
<INTERVAL>	Specifies the retransmit interval, in seconds. Range: 1 to 3600. Default: 5.

Examples

Setting OSPF retransmit interval on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf retransmit-interval 30
```

Setting OSPF retransmit interval to the default on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf retransmit-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf sha-key sha

```
ip ospf sha-key <KEY-ID> sha [{ciphertext | plaintext} <KEY>]
no ip ospf sha-key <KEY-ID>
```

Description

Sets the SHA (secure hash authentication) key for the selected interface. If the SHA key is given in ciphertext, it will be decrypted and applied to the protocol. This command accepts a key of up to 64 characters irrespective of the SHA version configured on the interface. OSPF will internally pad zeros to the key to obtain a 64-byte key. For all types of SHA, key length is adjusted to 64 bytes.

The **no** form of this command deletes the SHA authentication key.

Parameter	Description
<KEY-ID>	Specifies the SHA key ID. Range: 1 to 255.
`{ciphertext | plaintext}`	Selects the SHA key format.
<KEY>	Specifies the SHA authentication key.

When the authentication key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting the SHA authentication key in plaintext format:

```
switch(config)# interface 1/1/1
switch(config-if)# ip ospf sha-key 1 sha plaintext F82#450b
```

Setting the SHA authentication key in prompted plaintext format:

```
switch(config)# interface 1/1/1
switch(config-if)# ip ospf sha-key 1 sha
Enter the SHA authentication key: ********
Re-Enter the SHA authentication key: ********
```

Setting the SHA authentication key in ciphertext format:

```
switch(config)# interface 1/1/1
switch(config-if)# ip ospf sha-key 1 sha ciphertext AQapu...C2K47A=
```

Deleting the SHA authentication key:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip ospf sha-key 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-vlan`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ip ospf shutdown

```
ip ospf shutdown
no ip ospf shutdown
```

Description

Disables OSPF on the interface. The interface state changes to Down. It does not remove the interface from the OSPF area. To remove the interface, use the command **no ip ospf area**.

The **no** form of this command re-enables OSPF on the interface

Examples

Disabling OSPF on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf shutdown
```

Re-enabling OSPF on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf shutdown
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip ospf transit-delay

```
ip ospf transit-delay <DELAY>
no ip ospf transit-delay
```

Description

Sets the time delay in link state transmission for the OSPF interface.

The **no** form of this command sets the delay in link state transmission to the default of 1 second for the OSPF interface.

Parameter	Description
<DELAY>	Specifies the transit delay in seconds. Range: 1 to 3600. Default: 1.

Examples

Setting OSPF transit delay on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ip ospf transit-delay 30
```

Setting OSPF transit delay to the default on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ip ospf transit-delay
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

keychain

```
keychain <KEYCHAIN-NAME>
no keychain
```

Description

Sets the key chain for md5 authentication. A key chain configures rotating keys for packet authenticating, reducing the risk of keys being compromised.

The **no** form of this command deletes the key chain used for md5 authentication.

Parameter	Description
<KEYCHAIN-NAME>	Name of key chain to be used for md5 authentication.

Examples

Setting OSPF virtual link key chain authentication:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# keychain ospf_keys
```

Deleting OSPF virtual link key chain authentication:

```
switch# configure terminal
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link  100.0.1.1
switch(config-router-vlink)# no keychain
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

max-metric router-lsa

```
max-metric router-lsa [on-startup [<ADVERT-TIME>]]
no max-metric router-lsa [on-startup]
```

Description

Sets the protocol to advertise a maximum metric so that other routers do not prefer this router as an intermediate hop in their shortest path first (SPF) calculations. If the on-startup parameter is used, the router is configured to advertise a maximum metric at startup for the time mentioned in seconds or for a default value of 600 seconds.

The **no** form of this command advertises the normal cost metrics instead of advertising the maximized cost metric. This setting causes the router to be considered in traffic forwarding.

Parameter	Description
`on-startup <ADVERT-TIME>`	Specifies the time in seconds to advertise self as stub-router on startup. If no time is specified, the default time of 600 seconds is used. Range: 5 to 86400. Default: 600.

Examples

Setting to maximize the cost metrics for Router LSA:

```
switch(config)# router ospf 1
switch(config-ospf-1)# max-metric router-lsa
switch(config-ospf-1)# max-metric router-lsa on-startup
switch(config-ospf-1)# max-metric router-lsa on-startup 3000
```

Setting to advertise the normal cost metrics instead of advertising the maximized cost metric:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no max-metric router-lsa
switch(config-ospf-1)# no max-metric router-lsa on-startup
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

maximum-paths

```
maximum-paths <MAX-VALUE>
no maximum-paths
```

Description

Sets the maximum number of ECMP routes that OSPF can support.

The **no** form of this command sets the maximum number of ECMP routes that OSPF can support to the default value of 4.

Parameter	Description
<MAX-VALUE>	Specifies the maximum number of ECMP routes. Range: 1 to 32. Default: 4.

Examples

Setting maximum number of ECMP routes:

```
switch(config)# router ospf 1
switch(config-ospf-1)# maximum-paths 32
```

Setting maximum number of ECMP routes to the default of 4:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no maximum-paths
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.10	Increased upper limit of range of **<MAX-VALUE>** parameter to 32.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

message-digest-key md5

```
message-digest-key <KEY-ID> md5 [{ciphertext | plaintext} <KEY>]
no message-digest-key <KEY-ID>
```

Description

Sets the virtual link md5 message digest authentication key. If the md5 key is given in ciphertext, it will be decrypted and applied to the protocol.

The **no** form of this command deletes the virtual link md5 authentication key.

Parameter	Description
<KEY-ID>	Specifies the virtual link md5 key ID. Range: 1 to 255.
`{ciphertext | plaintext}`	Selects the virtual link md5 key format.
<KEY>	Specifies the virtual link md5 authentication key.

When the authentication key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting virtual link md5 authentication key in plaintext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# message-digest-key 1 md5 plaintext F82#450b
```

Setting the virtual link md5 authentication key in prompted plaintext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# message-digest-key 1 md5
Enter the MD5 authentication key: ********
Re-Enter the MD5 authentication key: ********
```

Setting the virtual link md5 authentication key in ciphertext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# message-digest-key 1 md5 ciphertext AQapu...C2K47A=
```

Deleting the virtual link md5 authentication password:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no message-digest-key 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

passive-interface default

```
passive-interface default
no passive-interface
```

Description

Configures all OSPF interfaces as passive.

The **no** form of this command sets all OSPF interfaces as active.

Examples

Setting OSPF-enabled interfaces as passive:

```
switch(config)# router ospf 1
switch(config-ospf-1)# passive-interface default
```

Setting OSPF-enabled interfaces as active:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no passive-interface
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

redistribute

```
redistribute {bgp | connected | host-routes | local loopback | static | rip | ospf
<PROCESS-ID>[route-map <ROUTE-MAP-NAME>]
no redistribute {bgp | connected | host-routes | local loopback | static | rip | ospf
<PROCESS-ID>}[route-map <ROUTE-MAP-NAME>]
```

Description

Redistributes routes originating from other protocols, or from another OSPFv2 process, to the current OSPFv2 process.

If a route map is specified, then only the routes that pass the match clause specified in the route map are redistributed to OSPFv2. Configuration is not allowed if the referenced route map has not yet been configured.

If you try to redistribute routes from an OSPFv2 process which is not created, you are prompted to allow the OSPFv2 process to be auto-created before proceeding with redistribution. If you confirm at the prompt, the OSPFv2 process is created with defaults and redistribution configuration applied. If you deny at the prompt, redistribution configuration is skipped.

If command **route-redistribute active-routes-only** has been issued, only the routes from other protocols which are selected for forwarding are considered for redistribution into OSPFv2.

The **no** form of this command disables redistribution of routes to the current OSPFv2 process.

Parameter	Description
`bgp`	Specifies redistributing BGP (Border Gateway Protocol) routes.
`connected`	Specifies redistributing connected (directly attached subnet or host).
`local loopback`	Specifies redistributing local routes of the loopback interface.
`static`	Specifies redistributing static routes.
`rip`	Specifies redistributing RIP routes.

Parameter	Description
ospf *<PROCESS-ID>*	Specifies redistributing routes from the specified OSPFv2 process ID. Range: 1 to 65535.
route-map *<ROUTE-MAP-NAME>*	Specifies redistribution filtering by route map. To create a route map, use command **route-map**.

Examples

Redistributing routes to OSPFv2:

```
switch(config)# router ospf 1
switch(config-ospf-1)# redistribute bgp
switch(config-ospf-1)# redistribute bgp route-map BGP_routes
```

```
switch(config-ospf-1)# redistribute host-routes
switch(config-ospf-1)# redistribute connected
switch(config-ospf-1)# redistribute connected route-map connected_routes
switch(config-ospf-1)# redistribute local loopback
switch(config-ospf-1)# redistribute local loopback route-map local_routes
switch(config-ospf-1)# redistribute static
switch(config-ospf-1)# redistribute static route-map static_networks
switch(config-ospf-1)# redistribute rip
switch(config-ospf-1)# redistribute rip route-map rip-routes
switch(config-ospf-1)# redistribute ospf 2
```

Disabling redistributing routes to OSPFv2:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no redistribute bgp
switch(config-ospf-1)# no redistribute bgp route-map BGP_routes
```

```
 switch(config-ospf-1)# no redistribute connected
switch(config-ospf-1)# no redistribute connected route-map connected_routes
switch(config-ospf-1)# no redistribute local loopback
switch(config-ospf-1)# no redistribute local loopback route-map local_routes
switch(config-ospf-1)# no redistribute static
switch(config-ospf-1)# no redistribute static route-map static_networks
switch(config-ospf-1)# no redistribute rip
switch(config-ospf-1)# no redistribute rip route-map rip-routes
switch(config-ospf-1)# no redistribute ospf 2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.08	Added **route-map** support for supported redistribute source-

Release	Modification
	protocols. Updated information and examples.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

reference-bandwidth

```
reference-bandwidth <BANDWIDTH>
no reference-bandwidth
```

Description

Sets the reference bandwidth for OSPFv2. If the OSPFv2 interface cost is not explicitly set, then the cost of all the OSPFv2 interfaces is recalculated based on the reference bandwidth and link speed of the interface.

For VLAN interfaces the link speed value is taken as 1 Gbps (if the OSPFv2 interface cost is not explicitly set).

The **no** form of this command sets the reference bandwidth for OSPF to the default of 100000 Mbps.

Parameter	Description
`<BANDWIDTH>`	Specifies the reference bandwidth used to calculate the cost of an interface in Mbps. Range: 1 to 4000000. Default: 100000.

Examples

Setting the reference bandwidth:

```
switch(config)# router ospf 1
switch(config-ospf-1)# reference-bandwidth 40000
```

Setting the reference bandwidth to the default value:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no reference-bandwidth
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospf-*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

retransmit-interval

```
retransmit-interval <INTERVAL>
no retransmit-interval
```

Description

Sets the time between retransmitting lost link state advertisements for virtual links.

The **no** form of this command sets the time between retransmitting lost link state advertisements to the default of 5 seconds for virtual links.

Parameter	Description
<INTERVAL>	Specifies the retransmit interval in seconds. Range: 1 to 3600. Default: 5.

Examples

Setting OSPFv2 virtual links retransmit interval:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# retransmit-interval 30
```

Setting OSPFv2 virtual links retransmit interval to default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no retransmit-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-router-vlink	Administrators or local user group members with execution rights for this command.

rfc1583-compatibility

```
rfc1583-compatibility
no rfc1583-compatibility
```

Description

Enables OSPF compatibility with RFC1583 (backward compatibility). If RFC1583 compatibility is enabled, then the route cost calculation follows a different method.

The **no** form of this command disables OSPF compatibility with RFC1583 (backward compatibility). By default the RFC1583 compatibility is disabled.

Examples

Enabling OSPF RFC1583 compatibility:

```
switch(config)# router ospf 1
switch(config-ospf-1)# rfc1583-compatibility
```

Disabling OSPF RFC1583 compatibility:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no rfc1583-compatibility
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospf-<PROCESS-ID>	Administrators or local user group members with execution rights for this command.

router ospf

```
router ospf <PROCESS-ID> [vrf <VRF-NAME>]
no router ospf <PROCESS-ID> [vrf <VRF-NAME>]
```

Description

Creates an OSPF process (if not created already) on a VRF, and switches to the OSPF router instance context. Up to eight OSPF processes are supported per VRF.

The **no** form of this command removes the OSPF instance.

Parameter	Description
<PROCESS-ID>	Specifies an OSPF process ID. Range: 1 to 65535.
vrf *<VRF-NAME>*	Specifies a VRF name for the OSPF process. Default: default.

Examples

```
switch(config)# router ospf 1
switch(config-ospf-1)#
```

```
switch(config)# router ospf 1 vrf vrf_red
```

```
switch(config)# no router ospf 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

router-id

```
router-id <ROUTER-ADDR>
no router-id
```

Description

Sets an ID for the router in an IPv4 address format.

The **no** form of this command unconfigures the router-id for the instance and sets the router-id to the default as follows: the router-id is selected dynamically as equal to the highest loopback address on the router, or the highest active interface if there are no loopback addresses. If no IP address is configured on any interfaces on the router, OSPF will not form an adjacency.

Parameter	Description
<ROUTER-ADDR>	Specifies the Router ID in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Examples

Setting router-id in the OSPF context:

```
switch(config)# router ospf 1
switch(config-ospf-1)# router-id 1.1.1.1
```

Unconfiguring router-id:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no router-id
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

sha-key sha

```
sha-key <KEY-ID> sha [{ciphertext | plaintext} <KEY>]
no sha-key <KEY-ID>
```

Description

Sets the SHA (secure hash authentication) key for the selected virtual link. If the SHA key is given in ciphertext, it will be decrypted and applied to the protocol. This command accepts a key of up to 64 characters irrespective of the SHA version configured on virtual link. OSPF will internally pad zeros to the key to obtain a 64-byte key. For all types of SHA, key length is adjusted to 64 bytes.

The **no** form of this command deletes the virtual link SHA authentication key.

Parameter	Description
<KEY-ID>	Specifies the virtual link SHA key ID. Range: 1 to 255.

Parameter	Description
{ciphertext | plaintext}	Selects the virtual link SHA key format.
<KEY>	Specifies the virtual link SHA authentication key.

When the authentication key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting virtual link SHA authentication key in plaintext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# sha-key 1 sha plaintext F82#450b
```

Setting the virtual link SHA authentication key in prompted plaintext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# sha-key 1 sha
Enter the SHA authentication key: ********
Re-Enter the SHA authentication key: ********
```

Setting the virtual link SHA authentication key in ciphertext format:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# sha-key 1 sha ciphertext AQapu...C2K47A=
```

Deleting the virtual link SHA authentication key:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no sha-key 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

show ip ospf

`show ip ospf [<PROCESS-ID>] [all-vrfs | vrf <VRF-NAME>]`

Description

Displays general OSPF, area, state, and configuration information.

Parameter	Description
<PROCESS-ID>	Enter an OSPF process ID to display general OSPF information for a particular OSPF process. Range: 1 to 65535.
`all-vrfs`	Optionally select to display general OSPF information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Examples

Showing general OSPF configurations:

```
switch# show ip ospf 200
VRF : Default                         Process : 200
-------------------------------------------------------------------

Router ID              : 1.1.1.1             OSPFv2                : Enabled
BFD                    : Disabled            SPF Start Interval    : 5000 ms
SPF Hold Interval      : 1000 ms             SPF Max Wait Interval : 1000 ms
LSA Start Interval     : 5000 ms             LSA Hold Interval     : 1000 ms
LSA Max Wait Interval  : 1000 ms             LSA Arrival Interval  : 1000 ms
External LSAs          : 4                   Checksum Sum          : 133302
ECMP                   : 4                   Reference Bandwidth   : 100000 Mbps
Area Border            : Yes                 AS Border             : No
GR Status              : Disabled            GR Interval           : 120 sec
GR State               : Inactive            GR Exit Status        : None
GR Helper              : Enabled             GR Strict LSA Check   : Enabled
GR Ignore Lost I/F     : Disabled            Internal Process ID   : 1
Summary address:
  prefix 10.1.1.0/24, advertise, tag 10

Area      Total    Active
-------------------------
Normal    2        1
Stub      2        1
NSSA      0        0

Area  : 0.0.0.1
----------------------------------
Area Type             : Normal     Status                 : Active
Total Interfaces      : 100        Active Interfaces      : 10
Passive Interfaces    : 5          Loopback Interfaces    : 85
SPF Calculation Count : 1500
Area ranges:
  ip-prefix 10.1.1.1/24, inter-area, advertise
Number of LSAs         : 5000       Checksum Sum           : 99122
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf border-routers

```
show ip ospf [<PROCESS-ID>]
     border-routers [all-vrfs | vrf <VRF-NAME>]
```

Description

Displays the OSPF routing table entries for Area Border Router (ABR) and Autonomous System Border Router (ASBR).

Parameter	Description
<PROCESS-ID>	Enter an OSPF process ID to display general OSPF information for a particular OSPF process. Range: 1 to 65535.
all-vrfs	Optionally select to display general OSPF information for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Examples

Showing OSPF border routers information:

```
switch# show ip ospf border-routers
VRF : default                        Process : 1
Internal Routing Table
-----------------------------------------------------

Codes: i - Intra-area route, I - Inter-area route
```

```
  Router-ID    Cost Type Area     SPF   Nexthop    Interface
i 40.40.40.40  10   ABR  0.0.0.0  71    192.0.2.1  1/1/1
i 60.60.60.60  20   ABR  0.0.0.0  71    192.0.2.1  1/1/1
i 40.40.40.40  10   ABR  0.0.0.1  71    192.0.2.1  1/1/2
i 60.60.60.60  20   ABR  0.0.0.1  71    192.0.2.1  1/1/2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf interface

```
show ip ospf [<PROCESS-ID>] interface [<interface-name>] [brief]
[all-vrfs | vrf <VRF-NAME>]  [vsx-peer]
```

Description

Displays general OSPF, area, state, and configuration information.

Parameter	Description
<PROCESS-ID>	Enter an OSPF process ID to display general OSPF information for a particular OSPF process. Range: 1 to 65535.
<interface-name>]	Specify the name of an OSPF interface.
brief	Include this parameter to display a brief overview of the following OSPF configuration information. ■ Interface: OSPF interface name. ■ Area: OSPF area ID. ■ Cost: The metric OSPF uses to judge a path's feasibility, calculated as (reference bandwidth / interface bandwidth). ■ State: Indicates if the interface is a designated router (**Dr**) or a backup designated router (**Backup-dr**). ■ Status: Indicates if the interface is **up** or **down**. ■ Flags: P - Passive A - Active.

Parameter	Description
`all-vrfs`	Optionally select to display general OSPF information for all VRFs.
`vrf` *`<VRF-NAME>`*	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing general OSPF configuration settings for the default VRF:

```
switch (config-if)# show ip ospf 1
VRF : default                          Process  : 1
----------------------------------------------------

RouterID               : 20.0.0.1           OSPFv2                 : Enabled
SPF Start Interval     : 200   ms
SPF Hold Interval      : 1000  ms           SPF Max Wait Interval  : 5000  ms
LSA Start Time         : 5000  ms           LSA Hold Time          : 0     ms
LSA Max Wait Time      : 0     ms           LSA Arrival            : 1000  ms
External LSAs          : 0                  Checksum Sum           : 0
ECMP                   : 4                  Reference Bandwidth    : 100000 Mbps
Area Border            : false              AS Border              : false
GR Status              : Enabled            GR Interval            : 120 sec
GR State               : inactive           GR Exit Status         : none
GR Helper              : Enabled            GR Strict LSA Check    : Enabled
GR Ignore Lost I/F     : Disabled
Summary address:

Area      Total     Active
------------------------------
Normal     1         1
Stub       0         0
NSSA       0         0

Area  : 0.0.0.0
----------------
Area Type              : Normal         Status               : Active
Total Interfaces       : 1              Active Interfaces    : 1
Passive Interfaces     : 0              Loopback Interfaces  : 0
SPF Calculation Count  : 4
Area ranges     :
Number of LSAs         : 3              Checksum Sum         : 82420
```

Showing OSPF configuration settings for all interfaces:

```
switch(config)# show ip ospf interface
Codes: DR - Designated router BDR - Backup designated router

Interface 1/1/1 is up, line protocol is up
--------------------------------------------
  VRF                 : default                Process             : 1
  IP Address          : 10.10.10.1/24          Area                : 0.0.0.0
  Status              : Up                     Network Type        : Broadcast
  Hello Interval      : 10    sec              Dead Interval       : 40    sec
  Transit Delay       : 1     sec              Retransmit Interval : 5     sec
  Link Speed          : 1000 Mbps
  Cost Configured     : 1                      Cost Calculated     : 1
  State/Type          : BDR                    Router Priority     : 1
  DR                  : 10.10.10.2             BDR                 : 10.10.10.1
  Link LSAs           : 0                      Checksum Sum        : 0
  Authentication      : Md5                    Passive             : Yes
Interface 1/1/2 is up, line protocol is up
--------------------------------------------
  VRF                 : default                Process             : 1
  IP Address          : 10.10.10.1/24          Area                : 0.0.0.0
  Status              : Up                     Network Type        : Broadcast
  Hello Interval      : 10    sec              Dead Interval       : 40    sec
  Transit Delay       : 1     sec              Retransmit Interval : 5     sec
  Link Speed          : 1000 Mbps
  Cost Configured     : 1                      Cost Calculated     : 1
  State/Type          : BDR                    Router Priority     : 1
  DR                  : 20.10.10.2             BDR                 : 20.10.10.1
  Link LSAs           : 0                      Checksum Sum        : 0
  Authentication      : Simple                 Passive             : No
```

Displaying brief OSPF information

```
switch(config-if)# show ip ospf interface brief
VRF : default   Process : 1
==============================
Total Number of Interfaces: 2
Flags: P - Passive  A - Active
Interface     Area             IP Address/Mask     Cost  State    Status   Flags
----------------------------------------------------------------------------------
-------
1/1/1         0.0.0.0          10.10.10.1/24       40    DR       Up       P
1/1/2         255.255.255.255  200.200.200.123/24  4     Waiting  Up       A
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.09	Output of the **show ip ospf interface** command includes flags to indicate whether the interface is in passive or active mode.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf lsdb

```
show ip ospf [<process-id>] lsdb
   adv-router {<ROUTER-ID> | self}
   area <AREA-ID>
   lsid <link-state-id>
   all-vrfs |{vrf <VRF-NAME>}
      asbr-summary
      database-summary
      external
      lsid <LINK-STATE-ID>
      network
      nssa-external
      router
      summary
```

Description

Shows the OSPF link state database summary for different OSPF LSAs (Link State Advertisement). Use the parameters to get information for a particular LSA.

Parameter	Description
`<PROCESS-ID>`	Enter an OSPF process ID to display general OSPF information for a particular OSPF process. Range: 1 to 65535.
`adv-router {<ROUTER-ID>|self}`	Select to display link states for a particular advertising router. Specify either a Router ID of the advertising router or specify **self** to show self-originated link states.
`area <AREA-ID>`	Select to display information filtered for the specified area in one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Value: 0 to 4294967295.
`lsid <LINK-STATE-ID>`	Select to display information filtered by link state identifier specified in IPv4 address format (A.B.C.D).
`all-vrfs|{vrf <vrf-name>`	Select **all-vrfs** to display general OSPF information for all VRFs, or use the **vrf *<VRF-NAME>*** option to display information for a specific VRF. Optionally select one of the following parameters to filter the link state database information.
`asbr-summary`	Show ASBR summary link states (LSA type 4).
`database-summary`	Select to display the count of each type of LSA and each area in the database. **NOTE:** The **database-summary** parameter does not support the **area <area-id>**, **lsid <link-state-id>** or **adv-router {<router-id>|self}** parameters.
`external`	Show external link states (LSA type 5).

Parameter	Description
	NOTE: The **external** parameter does not support the area **area <area-id>** parameter.
`network`	Show network LSAs (LSA type 2).
`nssa-external`	Show NSSA external link states (LSA type 7).
`router`	Show router LSAs (LSA type 1).
`summary`	Show network-summary link states (LSA type 3).

Examples

Showing OSPF link state database (LSDB) general information:

```
switch# show ip ospf lsdb
OSPF Router with ID (50.50.50.50) (Process ID 1 VRF default)
============================================================

Router Link State Advertisements (Area 0.0.0.0)
-----------------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID         Link Count  Bits
-----------------------------------------------------------------------------
40.40.40.40     930     0x80000004  0x2ea1      0            3           None
50.50.50.50     935     0x80000002  0x8b52      0            1           E
60.60.60.60     943     0x800003c5  0x9854      0            2           None

Network Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Router Count
------------------------------------------------------------------------
60.60.60.60     944     0x80000001  0x7179      1360007168  2
50.50.50.50     935     0x80000001  0x516a      19          1

Inter Area Prefix Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
------------------------------------------------------------------
40.40.40.40     929     0x80000001  0x2498      131072      FEC0:3344::/32
50.50.50.50     928     0x80000001  0x5b2f      65536       111::/64

Inter Area Router Link State Advertisements (Area 0.0.0.0)
---------------------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Destination Router ID
---------------------------------------------------------------------------------
40.40.40.40     929     0x80000001  0x2498      1           33.33.33.33

AS External Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
------------------------------------------------------------------
40.40.40.40     264     0x80000001  0x24cc4     1           10::/64
40.40.40.40     675     0x80000001  0x5b00f     2           11::/64

NSSA External Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
```

```
------------------------------------------------------------------
3.3.3.3         264     0x80000001  0x24ac2     1           200::/64

Link-local Link State Advertisements (Area 0.0.0.0)
---------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Interface
---------------------------------------------------------------------
50.50.50.50     264     0x80000001  0x653c4     19          1/1/1

Intra Area Prefix Link State Advertisements (Area 0.0.0.0)
----------------------------------------------------------------------------------
-------------
ADV Router      Age     Seq#        Checksum    LSID        Referenced LS Type
Referenced LSID
----------------------------------------------------------------------------------
-------------
50.50.50.50     263     0x80000001  0x1da34     1           0x2001              0
50.50.50.50     264     0x80000001  0x2a45d     1           0x2002              19
```

Showing ASBR summary link states:

```
switch# show ip ospf lsdb asbr-summary
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

ASBR Summary Link State Advertisements (Area 0.0.0.0)
-----------------------------------------------------

LSID            ADV Router      Age     Seq#            Checksum
------------------------------------------------------------------
209.165.201.3   60.60.60.60     944     0x80000001      0x7179
192.0.2.1       50.50.50.50     935     0x80000001      0x516a
```

Showing external link states:

```
switch# show ip ospf lsdb external
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

AS External Link State Advertisements
--------------------------------------

LSID            ADV Router      Age     Seq#            Checksum
------------------------------------------------------------------
209.165.201.3   60.60.60.60     944     0x80000001      0x7179
192.0.2.1       50.50.50.50     935     0x80000001      0x516a
```

Showing database summary:

```
switch# show ip ospf lsdb database-summary
OSPF Router with ID (10.1.1.1) (Process ID 1 VRF default)
==========================================================

Area 0.0.0.0 database summary
------------------------------

LSA Type             Count
```

```
---------------------------
Router               2
Network              1
Inter-area Summary   1
ASBR Summary         0
NSSA External        0
Subtotal             4

Process 1 database summary
---------------------------

LSA Type             Count
---------------------------
Router               2
Network              1
Inter-area Summary   1
ASBR Summary         0
NSSA External        0
AS External          0
Total                4
```

Showing router LSAs:

```
switch# show ip ospf lsdb router
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

Router Link State Advertisements (Area 0.0.0.0)
-----------------------------------------------

LSID            ADV Router      Age        Seq#       Checksum Link Count
-------------------------------------------------------------------------
1.1.1.2         1.1.1.2         15         0x80000004 0xf526    1
2.2.2.1         2.2.2.1         14         0x80000005 0x6c5e    2
2.2.2.2         2.2.2.2         104        0x80000004 0xf51a    1
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

Router Link State Advertisements (Area 0.0.0.0)
-----------------------------------------------

LSID            ADV Router      Age        Seq#       Checksum Link Count
-------------------------------------------------------------------------
1.1.1.2         1.1.1.2         15         0x80000004 0xf526    1
2.2.2.1         2.2.2.1         14         0x80000005 0x6c5e    2
2.2.2.2         2.2.2.2         104        0x80000004 0xf51a    1
```

Showing network LSAs:

```
switch# show ip ospf lsdb network
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

Network Link State Advertisements (Area 0.0.0.0)
------------------------------------------------

LSID            ADV Router      Age        Seq#       Checksum
----------------------------------------------------------------
1.1.1.2         1.1.1.2         141        0x80000001 0xc55e
```

```
2.2.2.2         2.2.2.2         230        0x80000001 0xa179
```

Showing network-summary link states:

```
switch# show ip ospf lsdb summary
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

Inter-area Summary Link State Advertisements (Area 0.0.0.0)
-----------------------------------------------------------

LSID            ADV Router      Age        Seq#       Checksum
----------------------------------------------------------------
1.1.1.0         2.2.2.1         133        0x80000002 0xa089

Inter-area Summary Link State Advertisements (Area 0.0.0.1)
-----------------------------------------------------------

LSID            ADV Router      Age        Seq#       Checksum
----------------------------------------------------------------
2.2.2.0         2.2.2.1         133        0x80000002 0x7caa
```

Showing NSSA external link states:

```
switch(config-ospf-1)# show ip ospf lsdb nssa-external
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

NSSA External Link State Advertisements (Area 0.0.0.1)
------------------------------------------------------

LSID            ADV Router      Age        Seq#       Checksum
----------------------------------------------------------------
8.8.8.0         1.1.1.2         162        0x80000003 0xc7b2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf neighbors

```
show ip ospf [<PROCESS-ID>] neighbors [<NEIGHBOR-ID>]
     [interface <INTERFACE-NAME>] [detail | summary]
     [all-vrfs | vrf <VRF-NAME>]
```

Description

Displays information about OSPF neighbors.

Parameter	Description
<PROCESS-ID>	Enter an OSPF process ID to display OSPF neighbor information for the particular OSPF process. Range: 1 to 65535.
`neighbors` *<NEIGHBOR-ID>*	Select to display information about a particular neighbor, specified in IPv4 format (A.B.C.D).
`interface` *<INTERFACE-NAME>*	Select to display neighbor information only for the specified interface.
`detail`	Select to display detailed information for all the neighbors.
`summary`	Select to display summary information for the neighbors.
`all-vrfs`	Select to display neighbor information for all VRFs.
`vrf` *<VRF-NAME>*	Specify the name of a VRF. Default: default.

Examples

Showing OSPF neighbors information for the default VRF:

```
switch# show ip ospf neighbors
OSPF Process ID 1 VRF default
==============================

Total Number of Neighbors: 1

Neighbor ID      Priority  State             Nbr Address       Interface
-------------------------------------------------------------------------
2.2.2.2          1         FULL/DR           10.1.1.2           1/1/1
```

Showing OSPF neighbors information for VRF red:

```
switch# show ip ospf neighbors vrf red
OSPF Process ID 1 VRF red
==========================

Total Number of Neighbors: 1

Neighbor ID      Priority  State             Nbr Address       Interface
-------------------------------------------------------------------------
1.1.1.1          1         FULL/BDR          10.1.1.1           1/1/1
```

Showing OSPF neighbors information for a specific neighbor:

```
switch# show ip ospf neighbors 2.2.2.2
switch# show ip ospf neighbors 2.2.2.2
VRF : default                         Process : 1
----------------------------------------------------------------
Router-Id      : 2.2.2.2              Area Id           : 0.0.0.0
Interface      : 1/1/1                Address           : 10.10.10.2
State          : FULL                 Neighbor Priority : 1
Dead Timer Due : 00:00:36             Options           : 0x42
```

Showing OSPF neighbors information for a specific neighbor and interface:

```
switch# show ip ospf neighbors 2.2.2.2 interface 1/1/1
VRF : default                         Process : 1
-----------------------------------------------

Router-Id      : 2.2.2.2              Area Id           : 0.0.0.0
Interface      : 1/1/1                Address           : 10.10.10.2
State          : FULL                 Neighbor Priority : 1
Dead Timer Due : 00:00:36             Options           : 0x42
```

Showing detail information for OSPF neighbors:

```
switch# show ip ospf neighbors detail
VRF : default                         Process : 1
----------------------------------------------

Router-Id      : 2.2.2.2              Area Id           : 0.0.0.0
Interface      : 1/1/1                Address           : 10.10.10.2
State          : FULL                 Neighbor Priority : 1
DR             : 10.10.10.2           BDR               : 10.10.10.1
Dead Timer Due : 00:00:38             Options           : 0x42
Retransmission Queue Length  : 0
Time Since Last State Change : 00h:11m:37s
```

Showing summary information for OSPF neighbors in the **default** VRF:

```
switch# show ip ospf neighbors summary
OSPF Process ID 1 VRF default, Neighbor Summary
================================================

Interface  Down Attempt Init TwoWay ExStart Exchange Loading Full  Total
-------------------------------------------------------------------------
1/1/1      0    0       0    0      0       0        0       1     1
1/1/2      0    0       0    0      0       0        0       0     0
Total      0    0       0    0      0       0        0       1     1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf routes

```
show ip ospf [<PROCESS-ID>] routes
     [<IPV4-ADDR>/<MASK>] [all-vrfs | vrf <VRF-NAME>]
```

Description

Displays OSPF routing table information.

Parameter	Description
<IPV4-ADDR>	Specify an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32.
<PROCESS-ID>	Enter an OSPF process ID to display OSPF neighbor information for the particular OSPF process. Range: 1 to 65535.
all-vrfs	Select to display neighbor information for all VRFs.
vrf *<VRF-NAME>*	Specify the name of a VRF. Default: default.

Examples

Showing OSPF routing table information:

```
switch# show ip ospf routes
Codes: i - Intra-area route, I - Inter-area route
       E1 - External type-1, E2 - External type-2

OSPF Process ID 1 VRF default, Routing Table
---------------------------------------------

Total Number of Routes : 2

10.1.1.0/24        (i) area: 0.0.0.0
     directly attached to interface 1/1/1, cost 1 distance 110
20.1.1.0/24        (I)
     via 10.1.1.2 interface 1/1/1, cost 2 distance 110
```

Showing OSPF routing table information for a specific subnet:

```
switch# show ip ospf routes 10.1.1.0/2
Codes: i - Intra-area route, I - Inter-area route
       E1 - External type-1, E2 - External type-2

OSPF Process ID 1 VRF default, Routing Table for prefixes 10.1.1.0/24
----------------------------------------------------------------------

Total Number of Routes : 1

10.1.1.0/24        (i) area: 0.0.0.0
     directly attached to interface 1/1/1, cost 1 distance 110
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf statistics

`show ip ospf [<PROCESS-ID>] statistics [all-vrfs | vrf <VRF-NAME>]`

Description

Displays OSPF statistics.

Parameter	Description
<PROCESS-ID>	Enter an OSPF process ID to display OSPF neighbor information for the particular OSPF process. Range: 1 to 65535.
`all-vrfs`	Select to display OSPF statistics information for all VRFs.
`vrf` *<VRF-NAME>*	Specify the name of a VRF. Default: default.

Examples

Showing OSPF statistics:

```
switch# show ip ospf statistics
OSPF Process ID 1 VRF default, Statistics (cleared 1h 16m 24s ago)
--------------------------------------------------------------

Unknown Interface Drops          : 0
Unknown Virtual Interface Drops : 0
Bad Instance ID Drops            : 0
Bad IP Header Length Drops       : 0
Wrong OSPF Version Drops         : 0
Bad Source IP Drops              : 0
Resource Failure Drops           : 0
Bad Header Length Drops          : 0
Total Drops                      : 0
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf statistics interface

```
show ip ospf [<PROCESS-ID>] statistics interface [<INTERFACE-NAME>]
     [all-vrfs | vrf <VRF-NAME>]
```

Description

Displays OSPF statistics for the OSPF-enabled interfaces.

Parameter	Description
<PROCESS-ID>	Enter an OSPF process ID to display OSPF-enabled interface statistics information on the specified OSPF process. Range: 1 to 65535.
<INTERFACE-NAME>	Select to display information only for the specified interface.
`all-vrfs`	Select to display OSPF-enabled interface statistics information for all VRFs.
`vrf` *<VRF-NAME>*	Specify the name of a VRF. Default: default.

Examples

Showing OSPF-enabled interfaces information:

```
switch# show ip ospf statistics interface 1/1/1
OSPF Process ID 1 VRF default, interface 1/1/1 statistics (cleared 0h 30m 28s ago)
==============================================================================

Tx Hello Packets      : 101               Rx Hello Packets       : 99
Tx Hello Bytes        : 101               Rx Hello Bytes         : 99
Tx DD Packets         : 101               Rx DD Packets          : 99
Tx DD Bytes           : 101               Rx DD Bytes            : 99
Tx LS Request Packets : 101               Rx LS Requests Packets : 99
Tx LS Request Bytes   : 101               Rx LS Request Bytes    : 99
Tx LS Update Packets  : 101               Rx LS Update Packets   : 99
Tx LS Update Bytes    : 101               Rx LS Update Bytes     : 99
Tx LS Ack Packets     : 101               Rx LS Ack Packets      : 99
Tx LS Ack Bytes       : 101               Rx LS Ack Bytes        : 99

Total Number of State Changes : 8
Number of LSAs                : 29
LSA Checksum Sum              : 2345
Total Transmit Failures       : 29
Total OSPF Packets Discarded  : 999

Reason                               Packets Dropped
------------------------------------------------------
Invalid type                         19
Invalid length                       9
Invalid checksum                     0
Invalid version                      23
Bad or unknown source                67
Area mismatch                        1
Self-originated                      19
Duplicate router ID                  9
Interface standby                    0
Total Hello packets dropped          60
  Network Mask mismatch              10
  Hello interval mismatch            10
  Dead interval mismatch             10
  Options mismatch                   10
  MTU mismatch                       10
  Neighbor ignored                   10
Authentication errors                12
  Type mismatch                      6
  Authentication failures            6
Wrong protocol                       0
Resource failures                    0
Bad LSA length                       0
Others                               0

Total LSAs Ignored : 176
Bad Type           : 10
Bad Length         : 56
Invalid Data       : 55
Invalid Checksum   : 55
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip ospf virtual-links

`show ip ospf [<PROCESS-ID>] virtual-links [brief] [all-vrfs | vrf <VRF-NAME>]`

Description

Displays the current state and parameters of the OSPF virtual links.

Parameter	Description
<PROCESS-ID>	Enter an OSPF process ID to display information on the OSPF virtual links for the particular OSPF process. Range: 1 to 65535.
brief	Select to display brief overview information for the OSPF virtual links.
all-vrfs	Select to display OSPF virtual links information for all VRFs.
vrf *<VRF-NAME>*	Specify the name of a VRF. Default: default.

Examples

Showing OSPF virtual links information:

```
switch# show ip ospf virtual-links
Virtual link to router 40.40.40.40 is up
-----------------------------------------

VRF                 : default                        Process             : 21
Transit Area        : 0.0.0.1                        Authentication      : No
Hello Interval      : 10                             Dead Interval       : 40
Transit Delay       : 1                              Retransmit Interval : 5
Number of Link LSAs : 0                              Checksum Sum        : 0
Number of State Shanges : 4
```

Showing brief overview information for OSPF virtual links:

```
switch# show ip ospf virtual-links brief
OSPF Process ID 1 VRF default
==============================
Total Number of Virtual Links: 1

Remote Router    Transit Area      Status
-----------------------------------------
2.2.2.2          0.0.0.1           down
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

summary-address

```
summary-address  <IPV4-ADDR>/<MASK> [no-advertise | tag <TAG-VALUE>]
no summary-address <prefix/length> [no-advertise | tag <tag-value>
```

Description

Summarizes the external routes with the matching address and mask. When advertising this route, its metric is set to the lowest cost path from among the routes that were summarized.

The **no** form of this command disables route summarization.

This command only works for an ASBR (Autonomous System Boundary Router).

Parameter	Description
<IPV4-ADDR>	Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32.
`no-advertise`	Do not advertise the aggregate route. Suppress routes that match the specified prefix/mask pair.
`tag` *<TAG-VALUE>*	Specify the tag for the aggregate route. The summary prefix will be advertised along with the tag value in External LSAs. Range: 0 to 4294967295

Examples

Setting OSPF route summarization:

```
switch(config)# router ospf 1
switch(config-ospf-1)# summary-address 10.1.0.0/16
```

Disabling route summarization:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no summary-address 10.1.0.0/16
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

timers lsa-arrival

```
timers lsa-arrival <DELAY>
no timers lsa-arrival
```

Description

Configures the minimum delay between receiving the same LSA from a peer. The same LSA is an LSA that contains the same LSA ID number, LSA type, and advertising router ID. If an instance of the same LSA arrives sooner before the delay expires, the LSA is dropped. Generally, the LSA arrival timer should be set to a value less than or equal to the start-time value for the command **timers throttle lsa start** on the neighbor.

The **no** form of this command sets the LSA timers to default values.

Parameter	Description
<DELAY>	Specifies the delay in milliseconds. Range: 0 to 600000. Default: 1000.

Examples

Setting the LSA arrival timer:

```
switch(config)# router ospf 1
switch(config-ospf-1)# timers lsa-arrival 10
```

Setting the LSA arrival timer to default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no timers lsa-arrival
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

timers throttle lsa

```
timers throttle lsa start-time <START-TIME> hold-time <HOLD-TIME> max-wait-time <WAIT-TIME>
no timers throttle lsa
```

Description

Configures the timers for LSA generation.

The **no** form of this command sets the LSA timers to default values.

Parameter	Description
`start-time <START-TIME>`	Specifies the initial wait time in milliseconds after which LSAs are generated. When set to 0, the LSAs are generated without any delay. Range: 0 to 600000. Default: 5000.
`hold-time <HOLD-TIME>`	Specifies the amount of time, in milliseconds, between regeneration of an LSA. The hold time doubles each time the same LSA must be regenerated, until **max-wait-time** is reached. When set to 0, LSA regeneration time is not increased. Range: 0 to 600000. Default: 0.
`max-wait-time <WAIT-TIME>`	Specifies the maximum wait time, in milliseconds, for regeneration of the same LSA. When set to 0, LSA regeneration time is not increased. Range: 0 to 600000. Default: 0.

Examples

Setting the LSA timers:

```
switch(config)# router ospf 1
switch(config-ospf-1)# timers throttle lsa start-time 100 hold-time 1000 max-wait-
time 10000
```

Setting LSA timers to default values:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no timers throttle lsa
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

timers throttle spf

```
timers throttle spf start-time <START-TIME> hold-time <HOLD-TINME>
max-wait-time <WAIT-TIME>
no timers throttle spf
```

Description

Configures timers for SPF calculation. There are three timers:

- **start-time** Is the initial delay before an SPF calculation is started. Default is 200 milliseconds.
- **hold-time** Is the progressive backoff time to wait before next scheduled SPF calculation. Default is 1000 milliseconds. If a route change event occurs during this period, the value doubles until it reaches the *max-wait-time*.
- **max-wait-time** Is the maximum time to wait before the next scheduled SPF calculation. Default is 5000 milliseconds. This is used to limit the SPF hold timer and also defines the time to be considered for which the OSPF LSDB has to be stable, after which the SPF throttle mechanism is reset.

The **no** form of this command sets all the configured non-default timers to default value.

Parameter	Description
<START-TIME>	Time in milliseconds to set timer for initial SPF delay. Default: 200.
<HOLD-TINME>	Time in milliseconds to set the minimum hold time between two consecutive SPF calculations. Default: 1000.
<WAIT-TIME>	Time in milliseconds to set the maximum wait time between two consecutive SPF calculations. Default: 5000.

Examples

Setting non-default timer values for SPF throttling:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# timers throttling spf start-time 500 hold-time 3000 max-
wait-time 9000
Switch(config-ospfv3-1)# show running-config current-context
router ospfv3 1
               area 0.0.0.0
               area 0.0.0.1
               area 0.0.0.2 nssa no-summary
               area 0.0.0.3 stub
```

Setting default timer values for SPF throttling after configuring non-default values:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no timers throttling spf
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

transit-delay

```
transit-delay <SECONDS>
no transit-delay
```

Description

Sets the time delay in Link state transmission for virtual links.

The **no** form of this command sets the delay in Link state transmission to the default of 1 second for virtual links.

Parameter	Description
<SECONDS>	Specifies the time delay for the transit delay, in seconds. Default: 1 second. Range: 1-3600.

Examples

Setting OSPFv2 virtual links transit delay:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# transit-delay 30
```

Setting OSPFv2 virtual links transit delay to default:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink)# no transit-delay
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

trap-enable

```
trap-enable
no trap-enable
```

Description

Enables the notification of the events to be sent as traps to the SNMP management stations for OSPF.

The **no** form of this command disables the notification of the events to be sent as traps to the SNMP management stations for OSPF.

Examples

Enabling sending notification of events as traps:

```
switch(config)# router ospf 1
switch(config-ospf-1)# trap-enable
```

Disabling sending notification of events as traps:

```
switch(config)# router ospf 1
switch(config-ospf-1)# no trap-enable
```

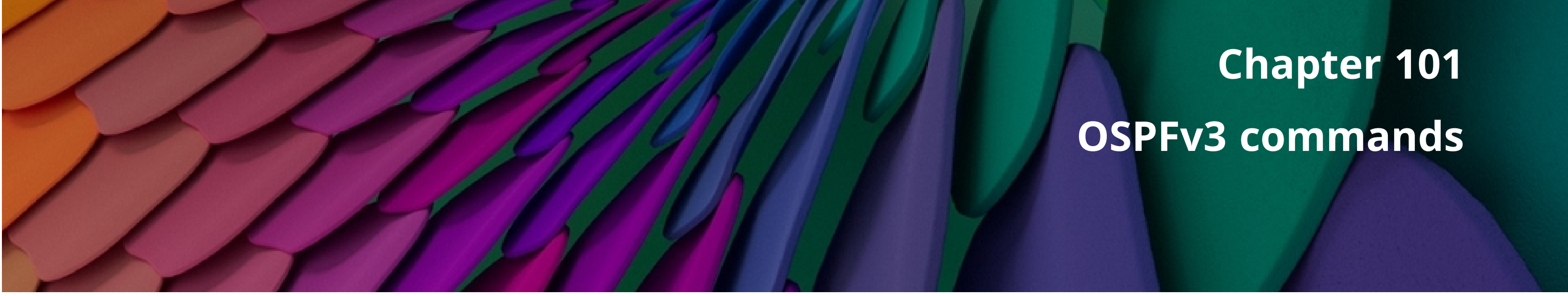
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.



Chapter 101
OSPFv3 commands

active-backbone

```
active-backbone stub-default-route
no active-backbone stub-default-route
```

Description

This command enables the router to send a default route to stub areas if there is an active loopback link in the backbone area. The configuration is not required if backbone area has neighbors or passive interfaces configured. By default active backbone detection is enabled.

Examples

```
switch(config)# router ospf 1
switch(config-ospf-1)# active-backbone stub-default-route
```

```
switch(config)# no active-backbone stub-default-route
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command Introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config-ospf-<PROCESS-ID>`
	`config-ospfv3-<PROCESS-ID>`
		Administrators or local user group members with execution rights for this command.

area

```
area <AREA-ID>
no area <AREA-ID>
```

Description

Creates a normal area with **<AREA-ID>** set if not present. If area is present and is not the normal area, this command changes the area type to normal area.

The **no** form of this command deletes the area with the **<AREA-ID>** specified. The area can be of any type (stub, stub no-summary, and default normal area).

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.

Examples

Creating a normal area:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1
switch(config-ospfv3-1)# area 1.1.1.1
```

Deleting an area:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no area 1
switch(config-ospfv3-1)# no area 1.1.1.1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospfv3-*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

area authentication ipsec

```
area <AREA-ID> authentication ipsec spi <SPI-INDEX> <AUTH-TYPE> [<KEY-TYPE> <AUTH-KEY>]
no area <AREA-ID> authentication
```

Description

Configures IPsec AH authentication for the specified area. OSPFv3 interfaces which have IPsec configured at the interface context will not use area level IPsec.

The **no** form of this command removes IPsec AH authentication for the specified area.

IPsec is not supported for 6in6 tunnel interfaces.

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats: OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
spi *<SPI-INDEX>*	Specifies the Security Parameters Index (SPI) to use. The SPI is an identification tag carried in the IPsec AH header. It enables the receiving OSPF process to select and use the Security Association (SA) from the SA table. The SPI must be unique on the switch. Range: 256 to 4294967295.
<AUTH-TYPE>	Specifies the authentication type: **md5** or **sha1**.
<KEY-TYPE>	Specifies the key type to use: **plaintext** (unencrypted), **hex-string** (encrypted) or **ciphertext** (encrypted).
<AUTH-KEY>	Specifies the authentication key.

When the authentication key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting area 0 to use IPsec authentication with a provided plaintext authentication key:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 0 authentication ipsec spi 256 sha1 plaintext
F82#450
```

Setting area 5 to use IPsec authentication with a prompted plaintext authentication key:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 5 authentication ipsec spi 256 sha1
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********
```

Removing IPsec authentication from area 1:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no area 1 authentication
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area encryption ipsec

```
area <AREA-ID> encryption ipsec spi <SPI-INDEX> <AUTH-TYPE>
    [<KEY-TYPE> <AUTH-KEY> <ENCR-TYPE> [<KEY-TYPE> <ENCR-KEY>]]
no area <AREA-ID> encryption
```

Description

Configures IPsec ESP with the authentication and encryption algorithm types and keys for the specified area. OSPFv3 interfaces with IPsec configured at the interface context will not use area level IPsec ESP configuration.

The **no** form of this command removes IPsec ESP from the specified area.

IPsec is not supported for 6in6 tunnel interfaces.

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
spi *<SPI-INDEX>*	Specifies the Security Parameters Index (SPI) to use. The SPI is an identification tag carried in the IPsec AH header. It enables the receiving OSPF process to select and use the Security Association (SA) from the SA table. The SPI must be unique on the switch. Range: 256 to 4294967295.
<AUTH-TYPE>	Specifies the authentication type: **md5** or **sha1**.
<KEY-TYPE>	Specifies the key type to use: **plaintext** (unencrypted), **hex-string** (encrypted) or **ciphertext** (encrypted).
<AUTH-KEY>	Specifies the authentication key.
<ENCR-TYPE>	Specifies the encryption type: **des**, **3des**, **aes**, or **null**. **NOTE:** Encryption type **aes** is considered to be AES128, AES192 or AES256 based on key length.
<ENCR-KEY>	Specifies the encryption key.

When the authentication key is not provided on the command line, plaintext authentication key prompting occurs upon pressing Enter, followed by encryption type prompting, and finally plaintext encryption key prompting. The entered key characters are masked with asterisks.

When the authentication key and encryption type are provided on the command line but the encryption key is not provided, plaintext encryption key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting area 0 to use IPSec ESP with provided authentication and encryption keys:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 0 encryption ipsec spi 256 md5 plaintext F824eva
                                des plaintext F82#450b
```

Setting area 5 to use IPSec ESP with prompted authentication and encryption keys:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 5 encryption ipsec spi 256 md5
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********

Enter the IPsec encryption type (3des/aes/des/null)? des

Enter the IPsec encryption key: ********
Re-Enter the IPsec encryption key: ********
```

Setting area 2 to use IPsec ESP with provided authentication password and encryption type but a prompted encryption key:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)#  area 2 encryption ipsec spi 256 md5 plaintext F82# des
Enter the IPsec encryption key: ********
Re-Enter the IPsec encryption key: ********
```

Setting area 0 to use IPSec ESP with provided plaintext authentication key and null encryption:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 0 encryption ipsec spi 256 md5 plaintext axtw null
```

Removing IPSec ESP from area 0:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no area 0 encryption
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area nssa

```
area <AREA-ID> nssa [no-summary]
no area <AREA-ID> nssa [no-summary]
```

Description

Creates the NSSA area (Not So Stubby Area) with **<AREA-ID>** if not present. If area is present and not NSSA area, this command changes the area type to NSSA area. If **no-summary** is used, area type will be NSSA No-Summary.

The **no** form of this command clears the NSSA area type. That is, the configured area will be changed to default normal area. The **no area <AREA-ID> nssa no-summary** command enables sending inter-area routes into NSSA, but will not unset the area as NSSA.

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
`nssa [no-summary]`	Specifies Not So Stubby Area (NSSA) area type. If area is present and not NSSA area, parameter changes the area type to NSSA area. If **no-summary** is specified, area type will be NSSA No-Summary, which means do not inject inter-area routes into NSSA.

Examples

Creating an NSSA area for OSPFv3:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1 nssa
switch(config-ospfv3-1)# area 1 nssa no-summary
```

Clearing the NSSA area for OSPFv3:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no area 1 nssa
switch(config-ospfv3-1)# no area 1 nssa no-summary
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area range

```
area <AREA-ID> range <IP-PREFIX> type {inter-area | nssa} [no-advertise]
no area <AREA-ID> range <IP-PREFIX> type {inter-area | nssa} [no-advertise]
```

Description

Summarizes the routes with the matching address or masks for OSPFv3. This command only works for border routers.

The **no** form of this command unsets the route summarization for the configured IPv4 prefix address on the ABR. When using the **no** form of the command with the **no-advertise** option, enables advertising this range to other areas.

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
`range <IP-PREFIX>`	Specifies summarizing routes matching the area range prefix/mask.
`type {inter-area	nssa}`	Specifies the type this address aggregation applies to as either inter-area range prefix or NSSA range prefix.
`no-advertise`	Specifies the address range status as **DoNotAdvertise** (do not advertise this range to other areas).

Examples

Summarizing inter-area or NSSA paths on OSPFv3:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1 range fd00::/64 type inter-area
switch(config-ospfv3-1)# area 1 range fd00::/64 type nssa
switch(config-ospfv3-1)# area 1 range fd00::/64 type inter-area no-advertise
```

Unsetting summarization on OSPFv3:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no area 1 range fd00::/64 type inter-area
switch(config-ospfv3-1)# no area 1 range fd00::/64 type nssa
switch(config-ospfv3-1)# no area 1 range fd00::/64 type inter-area no-advertise
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area stub

```
area <AREA-ID> stub [no-summary]
no area <AREA-ID> stub [no-summary]
```

Description

Creates the stub area with **<AREA-ID>** if not present. If area is present and is not the stub area, this command changes the area type to stub area. If **no-summary** is used, area type will be totally stubby area.

The **no** form of this command unsets the area type as stub. The configured area will be changed to the default normal area. The **no area <AREA-ID> stub no-summary** command will start sending Area Border Router (ABR) summary link advertisements into the stub area, but will not unset the stub area.

ABR does not inject the default route in a Totally Stubby Area with loopback in Area 0.0.0.0. As a workaround, configure a passive interface or active neighbors in the backbone area.

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Parameter	Description
	OSPF area identifier in decimal format. Range: 0 to 4294967295.
`stub [no-summary]`	Specifies stub area type. If area is present and not stub area, this parameter changes the area type to stub area. If **no-summary** is specified, area type will be totally stubby area, which means do not inject interarea routes into stub.

Examples

Creating a stub area:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1 stub
switch(config-ospfv3-1)# area 1 stub no-summary
```

Unsetting the stub area type:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1) # no area 1 stub
switch(config-ospfv3-1) # no area 1 sub no-summary
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

area virtual-link

```
area <AREA-ID> virtual-link <ROUTER-ID>
no area <AREA-ID> virtual-link <ROUTER-ID>
```

Description

Creates an OSPF virtual link with remote ABR (if not created already) and enters the vlink context.

The **no** form of this command deletes an OSPF virtual link with the specified router ID of the remote ABR. If no**<ROUTER-ID>** is specified, the **no** form of the command sets the virtual link to the default settings.

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
virtual-link *<ROUTER-ID>*	Configures a virtual link with the specified router ID of the remote ABR.

Examples

Configuring OSPF virtual links:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
```

Deleting OSPF virtual links:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no area 100 virtual-link 100.0.1.1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospfv3-*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

area default-metric

```
area <AREA-ID> default-metric <METRIC>
no area <AREA-ID> default-metric
```

Description

Sets the cost of default-summary LSAs announced to the stub/nssa areas.

The **no** form of this command resets the cost of the default-summary LSAs announced to stub/nssa areas to the default of 1.

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. OSPF area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPF area identifier in decimal format. Range: 0 to 4294967295.
default-metric *<METRIC>*	Specifies the default metric of default-summary LSAs announced to the stub/nssa areas, to the specified value. Default: 1. Range: 0 to 16777215.

Examples

Setting cost for default LSA summary:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1 default-metric 2
switch(config-ospfv3-1)# area 1.1.1.1 default-metric 2
```

Setting cost for default LSA summary to default:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no area 1 default-metric
switch(config-ospfv3-1)# no area 0.0.0.1 default-metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospfv3-*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

authentication ipsec

```
authentication ipsec spi <SPI-INDEX> <AUTH-TYPE> [<KEY-TYPE> <AUTH-KEY>]
no authentication
```

Description

Configures IPsec AH authentication for the selected Vlink.

The **no** form of this command removes IPsec AH authentication for the selected Vlink.

Parameter	Description
`spi <SPI-INDEX>`	Specifies the Security Parameters Index (SPI) to use. The SPI is an identification tag carried in the IPsec AH header. It enables the receiving OSPF process to select and use the Security Association (SA) from the SA table. The SPI must be unique on the switch. Range: 256 to 4294967295.
<AUTH-TYPE>	Specifies the authentication type: **md5** or **sha1**.
<KEY-TYPE>	Specifies the key type to use: **plaintext** (unencrypted), **hex-string** (encrypted) or **ciphertext** (encrypted).
<AUTH-KEY>	Specifies the authentication key.

When the authentication key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting area 1 to use IPsec AH authentication for Vlink with provided plaintext key:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch (config-router-vlink6)# authentication ipsec spi 256 sha1 plaintext F82#450
```

Setting area 1 to use IPsec AH authentication for Vlink with prompted plaintext key:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch (config-router-vlink6)# authentication ipsec spi 256 sha1
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: *******
```

Removing IPsec AH authentication for Vlink on area 1:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch(config-router-vlink6)# no authentication
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

clear ipv6 ospfv3 neighbors

```
clear ipv6 ospfv3 [<PROCESS-ID>] neighbor [<NEIGHBOR>] [interface [<INTERFACE-NAME>]]
[all-vrfs | vrf <VRF-NAME>]
```

Description

Resets the neighbor and clears the OSPF neighbor information.

Parameter	Description
<PROCESS-ID>	Specifies the OSPFv3 process ID to clear the statistics for the particular OSPFv3 process. Range: 1 to 65535.
<NEIGHBOR>	Specifies the router ID of a neighbor.
<INTERFACE-NAME>	Specifies the OSPFv3 statistics to clear for the specified interface.
`all-vrfs`	Select to clear the OSPFv3 statistics for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF.

Example

Clearing the OSPFv3 neighbor information:

```
switch# clear ipv6 ospfv3 1 neighbor
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ipv6 ospfv3 1 neighbor 3.3.3.3
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ipv6 ospfv3 1 neighbor interface 1/1/1
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ipv6 ospfv3 1 neighbor 3.3.3.3 vrf red
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ipv6 ospfv3 neighbor
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ipv6 ospfv3 neighbor 5.5.5.5
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ipv6 ospfv3 neighbor interface 1/1/1
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
switch# clear ipv6 ospfv3 neighbor 5.5.5.5 vrf red
Performing clear ospf neighbor may result in traffic disruption.
Do you want to continue (y/n)? y
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

clear ipv6 ospfv3 statistics

```
clear ipv6 ospfv3 [<PROCESS-ID>] statistics [interface [<INTERFACE-NAME>]]
[all-vrfs | vrf <VRF-NAME>]
```

Description

Clears the OSPFv3 event statistics.

Parameter	Description
<PROCESS-ID>	Specifies the OSPFv3 process ID to clear the statistics for the particular OSPFv3 process. Range: 1 to 65535.
<INTERFACE-NAME>	Specifies the OSPFv3 statistics to clear for the specified interface.
all-vrfs	Select to clear the OSPFv3 statistics for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF.

Example

Clearing the OSPFv3 event statistics:

```
switch# clear ipv6 ospfv3 statistics
switch# clear ipv6 ospfv3 statistics interface 1/1/1
switch# clear ipv6 ospfv3 statistics interface 1/1/1 vrf vrf_red
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

dead-interval

```
dead-interval <INTERVAL>
no dead-interval
```

Description

Sets the interval after which a neighbor is declared dead if no hello packet comes in for virtual links.

The **no** form of this command sets the dead interval to default for virtual links. The default value is 40 seconds (generally four times the hello packet interval).

Parameter	Description
<INTERVAL>	Specifies the time interval for the dead interval, in seconds. Range: 1 to 65535. Default: 40.

Examples

Setting OSPFv3 virtual links dead interval:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# dead-interval 30
```

Setting OSPFv3 virtual links dead interval to default:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# no dead-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

default-information originate

```
default-information originate [metric <METRIC-VALUE>]
no default-information originate [metric <METRIC-VALUE>]
```

Description

Configures OSPFv3 to advertise the default route (::/0) to its neighbors if it is present in the routing table. Optionally, the metric value can be set for default route ::/0. The default value is 1.

The **no** form of this command disables advertisement of the default route.

Parameter	Description
metric <METRIC-VALUE>	Specifies the OSPF metric value for the default route. Optional. Default: 1.

Examples

Setting advertisement of the default route:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# default-information originate
```

Disabling advertisement of the default route:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no default-information originate
```

Setting advertisement of the default route and specifying an optional metric value of 20:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# default-information originate
switch(config-ospfv3-1)# default-information originate metric 20
```

Disabling advertisement of the default route and setting metric to the default value:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no default-information originate metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.09	Added parameter: **metric <METRIC-VALUE>**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

default-metric

```
default-metric <METRIC-VALUE>
no default-metric
```

Description

Sets the default metric for redistributed routes in the OSPFv3.

The **no** form of this command sets the default metric to be used for redistributed routes into OSPFv3 to the default of 25.

Parameter	Description
<METRIC-VALUE>	Specifies the default metric value to use for redistributed routes. Range: 1 to 1677214. Default: 25.

Examples

Setting default metric for redistributed routes:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# default-metric 36
```

Setting default metric for redistributed routes to the default:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no default-metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

disable

```
disable
```

Description

Disables the OSPFv3 process. By default OSPFv3 process is enabled.

This command does not remove the OSPFv3 configurations.

Example

Disabling OSPFv3 process:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

distance

```
distance [<DISTANCE-VAL> | intra-area [<DISTANCE-VAL>] | inter-area [<DISTANCE-VAL>] |
external [<DISTANCE-VAL>]]
no distance [<DISTANCE-VAL> | intra-area [<DISTANCE-VAL>] | inter-area [<DISTANCE-VAL>] |
external [<DISTANCE-VAL>]]
```

Description

Defines an administrative distance for OSPFv3. Administrative distance is used as a criteria to select the best route when the same route is learned by multiple routing protocols.

The **no** form of this command sets the OSPFv3 administrative distance to the default value of 110. Optionally, administrative distance can be set to default for the specific OSPF route type: intra-area, inter-area, or external type-5 and type-7 routes.

Parameter	Description
<DISTANCE-VAL>	Specifies the OSPFv3 administrative distance. Range: 1 to 255. Default: 110.
`intra-area`	Specifies the OSPFv3 distance for intra-area routes.

Parameter	Description
`inter-area`	Specifies the OSPFv3 distance for inter-area routes.
`external`	Specifies the OSPFv3 distance for external type 5 and type 7 routes.

Usage

Within a given OSPF process, intra-area routes are always given precedence even when distances are configured for inter-area or external type routes.

Examples

Setting OSPFv3 administrative distance:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# distance 100
switch(config-ospfv3-1)# distance intra-area 24 external 55 inter-area 66
switch(config-ospfv3-1)# distance intra-area 24 external 55
switch(config-ospfv3-1)# distance external 55
switch(config-ospfv3-1)#exit

switch(config)# router ospfv3 2
switch(config-ospfv3-2)# distance 200
switch(config-ospfv3-2)# distance external 60
switch(config-ospfv3-2)# distance intra-area 24 inter-area 66
```

Setting OSPFv3 administrative distance to the default:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no distance
switch(config-ospfv3-1)# no distance external
switch(config-ospfv3-1)# no distance intra-area
switch(config-ospfv3-1)# no distance inter-area
switch(config-ospfv3-1)  # no distance 1
switch(config-ospfv3-1)#exit

switch(config)# router ospfv3 2 vrf blue
switch(config-ospfv3-2)# no distance 200
switch(config-ospfv3-2)# no distance external 60
switch(config-ospfv3-2)# no distance intra-area 24 inter-area 66
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Added capability to have individual admin distance for multiple OSPF processes in a VRF.
10.09	Added parameters: **intra-area**, **inter-area**, **external**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

distribute-list prefix

```
distribute-list prefix <prefix-list-name> {in | out}
no distribute-list prefix <prefix-list-name> {in | out}
```

Description

This command uses an existing prefix list to filter routes that are being installed in the routing table or redistributed to another routing protocol.

The **distribute-list prefix** command filters routes in the inbound or the outbound direction. When this command is issued with the **in** parameter, it filters routes from being installed in the routing table, it does not filter LSAs. When this command is issued with the **out** parameter, it filters only the desired redistributed routes from other protocols.

This command requires that your prefix list is already defined using the ipv6 prefix commands. Route-maps are not supported with the distribute-list feature.

Parameter	Description
`prefix <prefix-list-name>`	Specify the name of an existing prefix.
`{in | out}`	Select one of the following parameters to set the filter direction: ■ **in**: Filter incoming routes into the routing table ■ **out**: Filter outgoing routing updates

Examples

The following commands enable the filtering of OSPFv3 routes in an IPv6 network, so routes are no longer installed in the routing table or redistributed from another routing protocol.

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# distribute-list prefix listA in
switch(config-ospfv3-1)# distribute-list prefix listB out
```

The following command disables the filtering of OSPFv3 routes in an IPv6 network, so routes can be installed in the routing table or redistributed from another routing protocol.

```
switch# configure terminal
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no distribute-list prefix listA in
switch(config-ospfv3-1)# no distribute-list prefix listB out
```

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

enable

```
enable
```

Description

Enables OSPFv3 process when disabled. By default OSPFv3 process is enabled.

Example

Enabling OSPFv3 process:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

encryption ipsec

```
encryption ipsec spi <SPI-INDEX> <AUTH-TYPE> [<KEY-TYPE> <AUTH-KEY>
   <ENCR-TYPE> [<KEY-TYPE> <ENCR-KEY>]]
no encryption
```

Description

Configures IPSec ESP authentication and encryption for the selected Vlink.

The **no** form of this command removes IPSec ESP authentication and encryption for the selected Vlink.

Parameter	Description
`spi <SPI-INDEX>`	Specifies the Security Parameters Index (SPI) to use. The SPI is an identification tag carried in the IPsec AH header. It enables the receiving OSPF process to select and use the Security Association (SA) from the SA table. The SPI must be unique on the switch. Range: 256 to 4294967295.
<AUTH-TYPE>	Specifies the authentication type: **md5** or **sha1**.
<KEY-TYPE>	Specifies the key type to use: **plaintext** (unencrypted), **hex-string** (encrypted) or **ciphertext** (encrypted).
<AUTH-KEY>	Specifies the authentication key.
<ENCR-TYPE>	Specifies the encryption type: **des**, **3des**, **aes**, or **null**. **NOTE:** Encryption type **aes** is considered to be AES128, AES192, or AES256 based on key length.
<ENCR-KEY>	Specifies the encryption key.

When the authentication key is not provided on the command line, plaintext authentication key prompting occurs upon pressing Enter, followed by encryption type prompting, and finally plaintext encryption key prompting. The entered key characters are masked with asterisks.

When the authentication key and encryption type are provided on the command line but the encryption key is not provided, plaintext encryption key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting area 1 to use IPSec ESP authentication and encryption for Vlink with provided plaintext keys:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch(config-router-vlink6)# encryption ipsec spi 256 md5 plaintext F82#
                              des plaintext Plane#88
```

Setting area 1 to use IPSec ESP authentication and encryption for Vlink with prompted plaintext keys and encryption type:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch(config-router-vlink6)# encryption ipsec spi 256 md5
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: *******

Enter the IPsec encryption type (3des/aes/des/null)? des

Enter the IPsec encryption key: ********
```

```
Re-Enter the IPsec encryption key: ********
```

Setting area 1 to use IPSec ESP authentication and encryption for Vlink provided plaintext authentication key and encryption type but prompted plaintext encryption key:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch(config-router-vlink6)# encryption ipsec spi 256 md5 plaintext Fx des
Enter the IPsec encryption key: ********
Re-Enter the IPsec encryption key: ********
```

Setting area 1 to use IPSec ESP authentication for Vlink with a provided plaintext authentication key and null encryption:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch(config-router-vlink6)# encryption ipsec spi 256 md5 plaintext Fx null
```

Removing IPSec ESP authentication and encryption for Vlink on area 1:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 1 virtual-link 3.3.3.3
switch(config-router-vlink6)# no encryption
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

default-information originate

```
default-information originate [metric <METRIC-VALUE>]
no default-information originate [metric <METRIC-VALUE>]
```

Description

Configures OSPFv3 to advertise the default route (::/0) to its neighbors if it is present in the routing table. Optionally, the metric value can be set for default route ::/0. The default value is 1.

The **no** form of this command disables advertisement of the default route.

Parameter	Description
metric <METRIC-VALUE>	Specifies the OSPF metric value for the default route. Optional. Default: 1.

Examples

Setting advertisement of the default route:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# default-information originate
```

Disabling advertisement of the default route:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no default-information originate
```

Setting advertisement of the default route and specifying an optional metric value of 20:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# default-information originate
switch(config-ospfv3-1)# default-information originate metric 20
```

Disabling advertisement of the default route and setting metric to the default value:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no default-information originate metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.09	Added parameter: **metric <METRIC-VALUE>**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospf-*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

default-information originate always

```
default-information originate always [metric <METRIC-VALUE>]
no default-information originate always [metric <METRIC-VALUE>]
```

Description

Configures OSPFv3 to advertise the default route (::/0) to its neighbors, regardless if it is present in the routing table or not. Optionally, metric can be set for default route ::/0. The default value is 1.

The **no** form of this command disables advertisement of the default route.

Parameter	Description
metric <METRIC-VALUE>	Specifies the OSPFv3 metric value for the default route. Default: 1.

Examples

Setting advertisement of the default route:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# default-information originate always
```

Disabling advertisement of the default route:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no default-information originate always
```

Setting advertisement of the default route with metric set to 20:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# default-information originate always metric 20
```

Disabling advertisement of the default route and setting the metric to the default value:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no default-information originate always metric
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.09	Added parameter: **metric <METRIC-VALUE>**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospf-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

graceful-restart

```
graceful-restart
  restart-interval <INTERVAL>
  helper [strict-lsa-check]
  ignore-lost-interface
  no...
```

Description

Configures graceful restart for OSPFv3. By default graceful restart is enabled on the OSPFv3 router.

The **no** form of this command sets the restart interval to the default of 120 seconds or disables helper mode depending on the specified parameters.

Parameter	Description
`restart-interval <INTERVAL>`	Specifies the time another router waits for this router to gracefully restart and selects the maximum time to wait in seconds. Range: 5 to 1800. Default: 120.
`helper`	Specifies that the router will participate in the graceful restart of a neighbor router.
`strict-lsa-check`	(Optional). Use with the **helper** parameter to enable strict Link state Advertisement (LSA) checking when acting as a restart helper for a restarting peer. **NOTE:** OSPF neighbors must disable strict LSA checking. If the local node has fewer OSPF interfaces after restarting, then the neighbors that were adjacent on those interfaces will clear up their adjacencies to the restarting node and will send out link state updates to advertise the dropped adjacency. If strict LSA checking is enabled, the restarting router's neighbors will exit helper mode when they receive the updated LSAs and the graceful restart will still fail.
`ignore-lost-interface`	Enable the restarting router to ignore lost OSPF interfaces during a graceful restart process. This setting should be enabled on a high availability system to ensure a graceful restart completes successfully, even if OSPF-enabled links fail due to High Availability events like a switchover or failover. **NOTE:** Enabling this setting means that the hitless restart procedures do not strictly follow those defined in *RFC 3623, Graceful OSPF Restart*.
`no`	Negate any parameter or return the setting to its default..

Examples

Enabling OSPF graceful restart:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# graceful-restart restart-interval 40
switch(config-ospfv3-1)# graceful-restart helper strict-lsa-check
```

Enabling the switch to ignore lost OSPF interfaces during a graceful restart process:

```
switch(config)# router ospfv3 1
switch (config-ospfv3-1)# graceful-restart ignore-lost-interface
```

Setting the restart interval to default, and disabling helper mode:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no graceful-restart restart-interval
switch(config-ospfv3-1)# no graceful-restart helper
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

hello-interval

```
hello-interval <INTERVAL>
no hello-interval
```

For proper operation, the hello interval must be shorter than the dead interval.

Description

Sets the time interval between OSPF hello packets for virtual links.

The **no** form of this command sets the hello interval to the default value of 10 seconds for virtual links.

Parameter	Description
<INTERVAL>	Specifies the time interval for the hello interval, in seconds. Range: 1 to 65535. Default: 10.

Examples

Setting OSPF virtual links hello interval:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# hello-interval 30
```

Setting OSPF virtual links hello interval to default:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# no hello-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 area

```
ipv6 ospfv3 <PROCESS-ID> area <AREA-ID>
no ipv6 ospfv3 <PROCESS-ID> area <area-id>
```

Description

Runs the OSPFv3 protocol on the interface for the area specified.

To move an interface to a new area, unmap the existing area and then associate a new area with the interface.

The **no** form of this command disables OSPF on the interface and removes the interface from the area. Interfaces which have an IP address configured on the network or in a subset of the network, stop participating in the OSPF protocol

Parameter	Description
<AREA-ID>	Specifies the area ID is one of the following formats. Area ID in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. Area ID as a decimal value. Range: 0-4294967295.
<PROCESS-ID>	Specifies the OSPFv3 process ID. Range: 1 to 65535.

Examples

Setting OSPFv3 network for the area:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 1 area 1
switch(config-if-vlan)# ipv6 ospfv3 1 area 0.0.0.1
```

Disabling OSPFv3 network for the area:

```
switch(config)# interface 1/1/1
switch(config-if-vlan)# no ipv6 ospfv3 1 area 1
switch(config-if-vlan)# no ipv6 ospfv3 1 area 0.0.0.1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 authentication null

`ipv6 ospfv3 authentication null`

Description

Configures null authentication on an interface which disables IPsec authentication.

Examples

Disabling IPsec on interface VLAN **1**:

```
switch(config)# interface van 1
switch(config-if-vlan)# ipv6 ospfv3 authentication null
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 authentication ipsec

```
ipv6 ospfv3 authentication ipsec spi <SPI-INDEX> <AUTH-TYPE> [<KEY-TYPE> <AUTH-KEY>]
no ipv6 ospfv3 authentication
```

Description

Configures IPSec AH authentication. OSPFv3 interfaces that have IPsec configured at the interface context will not use area level IPsec.

The **no** form of this command removes IPsec AH authentication for the specified area.

Parameter	Description
`spi <SPI-INDEX>`	Specifies the Security Parameters Index (SPI) to use. The SPI is an identification tag carried in the IPsec AH header. It enables the receiving OSPF process to select and use the Security Association (SA) from the SA table. The SPI must be unique on the switch. Range: 256 to 4294967295.
<AUTH-TYPE>	Specifies the authentication type: **md5** or **sha1**.
<KEY-TYPE>	Specifies the key type to use: **plaintext** (unencrypted), **hex-string** (encrypted) or **ciphertext** (encrypted).
<AUTH-KEY>	Specifies the authentication key.

When the authentication key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting interface VLAN **1** to use IPsec authentication with a provided plaintext authentication key:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 authentication ipsec spi 256 md5 plaintext
F82#
```

Setting interface VLAN **4** to use IPsec authentication with a prompted plaintext authentication key:

```
switch(config)# interface vlan 4
switch(config-if-vlan)# ipv6 ospfv3 authentication ipsec spi 256 md5
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********
```

Removing IPsec authentication from interface VLAN **1**:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 authentication
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 cost

```
ipv6 ospfv3 cost <INTERFACE-COST>
no ipv6 ospfv3 cost
```

Description

Sets the cost (metric) associated with a particular interface. The interface cost is used as a parameter to calculate the best routes.

The **no** form of this command sets the cost (metric) associated with a particular interface to the default of 1.

Parameter	Description
<INTERFACE-COST>	Specifies the interface cost value. Range: 1 to 65535. Default: 1.

Examples

Setting OSPFv3 interface cost:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 cost 100
```

Setting the OSPFv3 interface cost to default:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 cost
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 dead-interval

```
ipv6 ospfv3 dead-interval <INTERVAL>
no ipv6 ospfv3 dead-interval
```

Description

Sets the interval after a neighbor is declared dead when no hello packet is received on the OSPFv3 interface.

The **no** form of this command sets the interval after which a neighbor is declared dead, to the default for the OSPFv3 interface. The default value is 40 seconds (generally four times the hello packet interval).

Parameter	Description
<INTERVAL>	Specifies the time interval for the dead interval, in seconds. Range: 1 to 65535. Default: 40.

Examples

Setting OSPFv3 dead interval on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 dead-interval 30
```

Setting OSPFv3 dead interval to default on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 dead-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 encryption ipsec

```
ipv6 ospfv3 encryption ipsec spi <SPI-INDEX> <AUTH-TYPE>
    [<KEY-TYPE> <AUTH-KEY> <ENCR-TYPE> [<KEY-TYPE> <ENCR-KEY>]]
no ipv6 ospfv3 encryption
```

Description

Configures IPsec ESP authentication. OSPFv3 interfaces that have IPsec configured at the interface context will not use area level IPsec ESP.

The **no** form of this command removes IPsec ESP for the specified area.

Parameter	Description
spi *<SPI-INDEX>*	Specifies the Security Parameters Index (SPI) to use. The SPI is an identification tag carried in the IPsec AH header. It enables the receiving OSPF process to select and use the Security Association (SA) from the SA table. The SPI must be unique on the switch. Range: 256 to 4294967295.
<AUTH-TYPE>	Specifies the authentication type: **md5** or **sha1**.
<KEY-TYPE>	Specifies the key type to use: **plaintext** (unencrypted), **hex-string** (encrypted) or **ciphertext** (encrypted).
<AUTH-KEY>	Specifies the authentication key.
<ENCR-TYPE>	Specifies the encryption type: **des**, **3des**, **aes**, or **null**. **NOTE:** Encryption type **aes** is considered to be AES128, AES192, or AES256 based on key length.
<ENCR-KEY>	Specifies the encryption key.

When the authentication key is not provided on the command line, plaintext authentication key prompting occurs upon pressing Enter, followed by encryption type prompting, and finally plaintext encryption key prompting. The entered key characters are masked with asterisks.

When the authentication key and encryption type are provided on the command line but the encryption key is not provided, plaintext encryption key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

Examples

Setting interface VLAN **1** to use IPsec ESP with provided authentication and encryption keys:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 encryption ipsec spi 256 sha1 plaintext F82
                        des plaintext F82#450b
```

Setting interface VLAN **3** to use IPsec ESP with prompted authentication and encryption keys:

```
switch(config)# interface vlan 3
switch(config-if-vlan)# ipv6 ospfv3 encryption ipsec spi 256 sha1
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********

Enter the IPsec encryption type (3des/aes/des/null)? des

Enter the IPsec encryption key: ********
Re-Enter the IPsec encryption key: ********
```

Setting interface VLAN **4** to use IPsec ESP with provided authentication password and encryption type but a prompted encryption key:

```
switch(config)# interface vlan 4
switch(config-if-vlan)# ipv6 ospfv3 encryption ipsec spi 256 sha1 plaintext F82
des
Enter the IPsec encryption key: ********
Re-Enter the IPsec encryption key: ********
```

Setting interface VLAN **1** to use IPSec ESP with provided plaintext authentication key and null encryption:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 encryption ipsec spi 256 sha1 plaintext F82
null
```

Removing IPsec from interface VLAN **1**:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 encryption
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 encryption null

```
ipv6 ospfv3 encryption null
```

Description

Configures NULL ESP on an interface which disables IPsec ESP.

Examples

Disable IPsec ESP on interface VLAN *1*:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 encryption null
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 hello-interval

```
ipv6 ospfv3 hello-interval <INTERVAL>
no ipv6 ospfv3 hello-interval
```

Description

Sets the time interval between OSPFv3 hello packets for the OSPFv3 interface.

The **no** form of this command sets the time interval between OSPFv3 hello packets to the default for the OSPFv3 interface of 10 seconds.

Parameter	Description
<INTERVAL>	Specifies the time interval between hello packets, in seconds. Range: 1 to 65535. Default: 10.

Examples

Setting OSPFv3 hello interval on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 hello-interval 30
```

Setting OSPFv3 hello interval to default on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 hello-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if config-if-vlan	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 network

```
ipv6 ospfv3 network {broadcast|point-to-point}
no ipv6 ospfv3 network
```

Description

Configures the network type for the interface. By default the network type is broadcast network.

The **no** form of this command sets the network type for the interface to the system default of broadcast network.

Parameter	Description
broadcast	Specifies the OSPFv3 network type as a broadcast multiaccess

Parameter	Description
	network.
`point-to-point`	Specifies the OSPFv3 network type as a point-to-point network.

Examples

Setting OSPFv3 network type for the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 network broadcast
switch(config-if-vlan)# ipv6 ospfv3 network point-to-point
```

Disabling OSPFv3 network type for the interface to system default of broadcast network:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 network
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 passive

```
ipv6 ospfv3 passive
no ipv6 ospfv3 passive
```

Description

Configures the interface as an OSPFv3 passive interface. With this setting, the interface participates in the OSPF, but does not send or receive OSPF packets on that interface.

The **no** form of this command resets the interface as active. With this setting, the interface starts sending and receiving OSPF packets.

Examples

Setting the interface as OSPFv3 passive interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 passive
```

Setting the interface as OSPFv3 active interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 passive
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 priority

```
ipv6 ospfv3 priority <number-value>
no ipv6 ospfv3 priority
```

Description

Sets the OSPFv3 priority for the interface. The larger the numeric value of the priority, the higher the chance it will become the designated router. Setting a priority of 0 makes the router ineligible to become a designated router or back up designated router.

The **no** form of this command sets the OSPFv3 priority for the interface to the default of 1.

Parameter	Description
<number-value>	Specifies the OSPFv3 priority value. Default: 1. Range: 0 to 255.

Examples

Setting the OSPFv3 priority for the interface:

```
switch(config)# interface vlan /1
switch(config-if-vlan)# ipv6 ospfv3 priority 50
```

Setting the OSPFv3 priority for the interface to the default of 1:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 priority
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 retransmit-interval

```
ipv6 ospfv3 retransmit-interval <INTERVAL>
no ipv6 ospfv3 retransmit-interval
```

Description

Sets the time between retransmitting lost link state advertisements for the OSPFv3 interface.

The **no** form of this command sets the time between retransmitting lost link state advertisements to the default 5 seconds.

Parameter	Description
<INTERVAL>	Specifies the time interval for the retransmit interval, in seconds. Range: 1 to 3600. Default: 5

Examples

Setting OSPFv3 retransmit interval on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 retransmit-interval 30
```

Setting OSPFv3 retransmit interval to the default on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 retransmit-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 shutdown

```
ipv6 ospfv3 shutdown
no ipv6 ospfv3 shutdown
```

Description

Disables OSPFv3 on the interface. The interface state changes to Down. It does not remove the interface from the OSPF area. To remove the interface, use the command **no ip ospf area**.

The **no** form of this command re-enables OSPFv3 on the interface.

Examples

Disabling OSPFv3 on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 shutdown
```

Re-enabling OSPFv3 on the interface:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 shutdown
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ipv6 ospfv3 transit-delay

```
ipv6 ospfv3 transit-delay <DELAY>
no ipv6 ospfv3 transit-delay
```

Description

Sets the time delay in Link state transmission for the OSPFv3 interface.

The **no** form of this command sets the transit delay in Link state transmission to the default of 1 second.

Parameter	Description
<DELAY>	Specifies the time delay for the transit delay, in seconds. Range: 1 to 3600. Default: 1.

Examples

Setting OSPFv3 transit delay on the interface

```
switch(config)# interface vlan 1
switch(config-if-vlan)# ipv6 ospfv3 transit-delay 30
```

Setting OSPFv3 transit delay to default on the interface

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no ipv6 ospfv3 transit-delay
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

maximum-paths

```
maximum-paths <MAXIMUM>
no maximum-paths
```

Description

Sets the maximum number of ECMP routes that OSPFv3 can support.

The **no** form of this command sets the maximum number of ECMP routes that OSPFv3 can support to the default value of 4.

Parameter	Description
<MAXIMUM>	Specifies the maximum number of ECMP routes. Range: 1 to 32. Default: 4.

Examples

Setting maximum number of parallel routes:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# maximum-paths 32
```

Setting maximum number of parallel paths to the default value of 4:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no maximum-paths
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.10	Increased upper limit of range of **<MAXIMUM>** parameter to 32.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospfv3-*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

max-metric router-lsa

```
max-metric router-lsa [on-startup <INTERVAL>]
no max-metric router-lsa [on-startup]
```

Description

Sets the protocol to advertise a maximum metric so that other routers do not prefer the router as an intermediate hop in their shortest path first (SPF) calculations. If the on-startup parameter is used, the router is configured to advertise a maximum metric at startup. That is, for the time specified in seconds, or the default value of 600 seconds.

To disable advertisement of the maximum metric, use the **no** form of the command.

The **no** form of this command advertises the normal cost metrics instead of advertising the maximized cost metric. This setting causes the router to be considered in traffic forwarding.

Parameter	Description
`on-startup  <INTERVAL>`	Automatically advertises the stub Router-LSA (or maximize the router-LSA cost metric) for a specified time interval upon OSPFv3 startup. Specifies the time in seconds. Range: 5 to 86400. Default: 600.

Examples

Setting to maximize the cost metrics for Router LSA:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# max-metric router-lsa
switch(config-ospfv3-1)# max-metric router-lsa on-startup 3000
```

Setting to advertise the normal cost metrics instead of advertising the maximized cost metric:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no max-metric router-lsa
switch(config-ospfv3-1)# no max-metric router-lsa on-startup
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

passive-interface default

```
passive-interface default
no passive-interface default
```

Description

Sets all OSPFv3 interfaces as passive.

The **no** form of this command sets all the OSPFv3 interfaces as active.

Examples

Setting OSPFv3-enabled interfaces as passive:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# passive-interface default
```

Setting OSPFv3-enabled interfaces as active:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no passive-interface default
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

redistribute

```
redistribute {bgp | connected | host-routes | local loopback | static | ripng | ospf
<PROCESS-ID>}
             [route-map <ROUTE-MAP-NAME>]
no redistribute {bgp | connected | host-routes | local loopback | static | ripng | ospf
<PROCESS-ID>}
                [route-map <ROUTE-MAP-NAME>]
```

Description

Redistributes routes originating from other protocols, or from another OSPFv3 process, to the current OSPFv3 process.

If a route map is specified, then only the routes that pass the match clause specified in the route map are redistributed to OSPFv3. Configuration is not allowed if the referenced route map has not yet been configured.

If you try to redistribute routes from an OSPFv3 process which is not created, you are prompted to allow the OSPFv3 process to be auto-created before proceeding with redistribution. If you confirm at the prompt, the OSPFv3 process is created with defaults and redistribution configuration applied. If you deny at the prompt, redistribution configuration is skipped.

If command **route-redistribute active-routes-only** has been issued, only the routes from other protocols which are selected for forwarding are considered for redistribution into OSPFv3.

The **no** form of this command disables redistribution of routes to the current OSPFv3 process.

Parameter	Description
bgp	Specifies redistributing BGP (Border Gateway Protocol) routes.
connected	Specifies redistributing connected (directly attached subnet or host).
local loopback	Specifies redistributing local routes of the loopback interface.
static	Specifies redistributing static routes.
ripng	Specifies redistributing RIPng routes.
ospf *<PROCESS-ID>*	Specifies redistributing routes from the specified OSPFv3 process ID. Range: 1 to 65535.
route-map *<ROUTE-MAP-NAME>*	Specifies redistribution filtering by route map. To create a route map, use command **route-map**.

Examples

Redistributing routes to OSPFv3:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# redistribute bgp
switch(config-ospfv3-1)# redistribute bgp route-map BGP_routes
```

```
switch(config-ospfv3-1)# redistribute connected
switch(config-ospfv3-1)# redistribute connected route-map connected_routes
switch(config-ospfv3-1)# redistribute local loopback
switch(config-ospfv3-1)# redistribute local loopback route-map local_routes
switch(config-ospfv3-1)# redistribute static
switch(config-ospfv3-1)# redistribute static route-map static_networks
switch(config-ospfv3-1)# redistribute ripng
switch(config-ospfv3-1)# redistribute ripng route-map rip-routes
switch(config-ospfv3-1)# redistribute ospf 2
```

Disabling redistributing routes to OSPFv3:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no redistribute bgp
switch(config-ospfv3-1)# no redistribute bgp route-map BGP_routes
```

```

switch(config-ospfv3-1)# no redistribute connected
switch(config-ospfv3-1)# no redistribute connected route-map connected_routes
switch(config-ospfv3-1)# no redistribute local loopback
switch(config-ospfv3-1)# no redistribute local loopback route-map local_routes
switch(config-ospfv3-1)# no redistribute static
switch(config-ospfv3-1)# no redistribute static route-map static_networks
switch(config-ospfv3-1)# no redistribute ripng
switch(config-ospfv3-1)# no redistribute ripng route-map rip-routes
switch(config-ospfv3-1)# no redistribute ospf 2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.08	Added **route-map** support for supported redistribute source-protocols. Updated information and examples.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

reference-bandwidth

```
reference-bandwidth <BANDWIDTH>
no reference-bandwidth
```

Description

Sets the reference bandwidth for OSPFv3. If the OSPFv3 interface cost is not explicitly set, then the cost of all the OSPFv3 interfaces is recalculated based on the reference bandwidth and link speed of the interface.

For VLAN interfaces the calculated link speed value is 1 Gbps (if the OSPFv3 interface cost is not explicitly set).

The **no** form of this command sets the reference bandwidth for OSPF to the default of 100000 Mbps.

Parameter	Description
<BANDWIDTH>	Specifies the reference bandwidth used to calculate the cost of an interface in Mbps. Range: 1 to 4000000. Default: 100000.

Examples

Setting the reference bandwidth:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# reference-bandwidth 40000
```

Setting the reference bandwidth to the default value:

```
switch(config)# routerv3 ospf 1
switch(config-ospfv3-1)# no reference-bandwidth
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

retransmit-interval

```
retransmit-interval <INTERVAL>
no retransmit-interval
```

Description

Sets the time between retransmitting lost link state advertisements for virtual links.

The **no** form of this command sets the time between retransmitting lost link state advertisements to the default of 5 seconds for virtual links.

Parameter	Description
<INTERVAL>	Specifies the time interval for the retransmit interval, in seconds. Range: 1 to 3600. Default: 5.

Examples

Setting OSPFv3 virtual links retransmit interval:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# retransmit-interval 30
```

Setting OSPFv3 virtual links retransmit interval to default:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# no retransmit-interval
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

router-id

```
router-id <ROUTER-ADDRESS>
no router-id
```

Description

Sets an ID for the router in an IPv4 address format.

The **no** form of this command unconfigures the router-id for the instance and sets the router-id to the default. The router-id is changed to the dynamically selected router-id. The default router-id 0.0.0.0 updates to the routing stack that triggers to auto-elect a router-id based on the highest IP address of loopback interface, or the highest IP address of interfaces.

Parameter	Description
<ROUTER-ADDRESS>	Specifies the router address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Examples

Setting router-id in the OSPFv3 context:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1) # router-id 1.1.1.1
```

Unconfiguring router-id:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no router-id
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

router ospfv3

```
router ospfv3 <PROCESS-ID> [vrf <VRF-NAME>]
no router ospfv3 <PROCESS-ID> [vrf <VRF-NAME>]
```

Description

Creates the OSPFv3 process (if not created already) and enters the router OSPFv3 instance context. Optionally if specified, you can specify a named VRF, or the default VRF if the <*vrf-name*> is not specified. Only one OSPFv3 process is allowed per VRF.

The **no** form of this command removes the OSPFv3 instance. If a VRF is specified, it removes the OSPF instance from the named VRF, or the default VRF if the <*var-name*> is not specified.

Parameter	Description
`<PROCESS-ID>`	Specifies an OSPFv3 process ID. Length: 1 to 65535.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Examples

Entering the router OSPFv3 instance:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)#
```

Setting the router OSPFv3 VRF instance:

```
switch(config)# router ospfv3 1 vrf vrf_red
```

Removing the router OSPFv3 instance:

```
switch#(config)# no router ospfv3 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ipv6 ospfv3

`show ipv6 ospfv3 [<PROCESS-ID>] [all-vrfs | vrf <VRF-NAME>]`

Description

Shows OSPFv3 information including area, state, and configuration information.

Parameter	Description
<PROCESS-ID>	Specifies an OSPFv3 process ID optionally to show OSPFv3 information for a particular OSPFv3 process. Range: 1 to 65535.
`all-vrfs`	Select to show OSPFv3 information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Example

Showing general OSPFv3 configurations:

```
switch# show ipv6 ospfv3 200
VRF : default                          Process : 200
---------------------------------------------------------------------

Router ID              : 1.1.1.1          OSPFv3                 : Enabled
BFD                    : Disabled         SPF Start Interval     : 200 ms
SPF Hold Interval      : 1000 ms          SPF Max Wait Interval  : 5000 ms
LSA Start Interval     : 5000 ms          LSA Hold Interval      : 1000 ms
LSA Max Wait Interval  : 1000 ms          LSA Arrival Interval   : 1000 ms
External LSAs          : 0                Checksum Sum           : 0
ECMP                   : 4                Reference Bandwidth    : 100000 Mbps
Area Border            : Yes              AS Border              : No
GR Status              : Enabled          GR Interval            : 120 sec
GR State               : Inactive         GR Exit Status         : None
GR Helper              : Enabled          GR Strict LSA Check    : Enabled
GR Ignore Lost I/F     : Disabled         Internal Process ID    : 1
Summary address:
  prefix fd00::1/64, advertise, tag 10

Area      Total Active
----------------------
Normal      2      2
Stub        0      0

Area  : 0.0.0.0
----------------------------------
Area Type             : Normal       Status               : Active
Total Interfaces      : 1            Active Interfaces    : 1
Passive Interfaces    : 0            Loopback Interfaces  : 0
SPF calculation count : 4
```

```
Area ranges:
  fd00::1/64, inter-area, no-advertise
AH Authentication     : SHA1, SPI 256
Number of LSAs        : 5            Checksum Sum         : 99122

Area  : 0.0.0.1
---------------------------------
Area Type             : Normal       Status               : Active
Total Interfaces      : 1            Active Interfaces    : 1
Passive Interfaces    : 0            Loopback Interfaces  : 0

SPF Calculation Count : 4
Area ranges:
  fd00::1/64, inter-area, no-advertise
ESP Authentication    : SHA1
Encryption            : 3DES, SPI 256
Number of LSAs        : 5            Checksum Sum         : 99122
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 border-routers

`show ipv6 ospfv3 [<PROCESS-ID>] border-routers [all-vrfs | vrf <VRF-NAME>]`

Description

Shows the OSPFv3 routing table entries for Area Border Router (ABR) and Autonomous System Border Router (ASBR).

Parameter	Description
`<PROCESS-ID>`	Specifies an OSPFv3 process ID to show the OSPFv3 routing table entries for ABR and ASBR for the particular OSPFv3 process. Range: 1 to 65535.
`all-vrfs`	Select to show OSPFv3 border router information for all VRFs.

Parameter	Description
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Example

On the 6400 Switch Series, interface identification differs.

Showing OSPFv3 border routers information for VRF **vrf_red**:

```
switch# show ipv6 ospfv3 border-routers vrf vrf_red
VRF : vrf_red       Process ID : 1
             Internal Routing Table
--------------------------------------------------------

Codes: i - Intra-area route, I - Inter-area route
   Router-ID Cost  Type    Area    SPF  Nexthop                     Interface
i  1.1.1.1   1     ASBR    0.0.0.0 9    fe80::7272:cfff:fe9a:a15d   1/1/2
i  3.3.3.3   1     ASBR    1.1.1.1 9    fe80::7272:cfff:fe1f:d80   ** tunnel1
```

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 interface

```
show ipv6 ospfv3 [<PROCESS-ID>] interface [<INTERFACE-NAME>] [brief]
[all-vrfs | vrf <VRF-NAME>]
```

Description

Shows information about OSPFv3 enabled interfaces.

Parameter	Description
<PROCESS-ID>	Specifies an OSPFv3 process ID optionally to show the OSPFv3 enabled interfaces for the particular OSPFv3 process. Range: 1 to 65535.
<INTERFACE-NAME>	Selects to show information only for the specified OSPFv3-enabled interface.

Parameter	Description
`brief`	Include this parameter to display a brief overview of the following OSPF configuration information. - Interface: OSPF interface name. - Area: OSPF area ID. - Cost: The metric OSPF uses to judge a path's feasibility, calculated as (reference bandwidth / interface bandwidth). - State: Indicates if the interface is a designated router (**Dr**) or a backup designated router (**Backup-dr**). - Status: Indicates if the interface is **up** or **down**. - Flags: P - Passive A - Active.
`all-vrfs`	Select to show OSPF-enabled interface information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Examples

On the 6400 Switch Series, interface identification differs.

Showing OSPFv3 information for all interfaces in default VRF:

```
switch# show ipv6 ospfv3 interface
Codes: DR - Designated router  BDR - Backup Designated router

Interface 1/3/10 is Up, Line Protocol is Up
--------------------------------------------
VRF                    : default                         Process              : 1
IPv6 address           : fe80::9020:c203:280a:e800       Area                 :
0.0.0.0
Status                 : Up                              Network Type         :
Broadcast
Hello Interval         : 10    sec                       Dead Interval        : 40
 sec
Transit Delay          : 1     sec                       Retransmit Interval  : 5
 sec
BFD                    : Disabled                        Link Speed           : 1000
Mbps
Cost Configured        : NA                              Cost Calculated      : 100
State/Type             : DR                              Router Priority      : 2
DR                     : 1.1.1.1                         BDR                  :
2.2.2.2
Link LSAs              : 2                               Checksum Sum         :
39245
Authentication         : no                              Passive              : No

Codes: DR - Designated router  BDR - Backup Designated router

Interface 1/3/11 is Up, Line Protocol is Up
--------------------------------------------
VRF                    : default                         Process              : 1
IPv6 address           : fe80::9020:c203:2c0a:e800       Area                 :
0.0.0.1
Status                 : Up                              Network Type         :
Broadcast
Hello Interval         : 10    sec                       Dead Interval        : 40
 sec
Transit Delay          : 1     sec                       Retransmit Interval  : 5
 sec
```

```
BFD                     : Disabled                          Link Speed              : 1000
Mbps
Cost Configured         : NA                                Cost Calculated         : 100
State/Type              : BDR                               Router Priority         : 1
DR                      : 3.3.3.3                           BDR                     :
1.1.1.1
Link LSAs               : 2                                 Checksum Sum            :
83119
Authentication          : no                                Passive                 : No
```

Showing overview information for OSPFv3 enabled interfaces for all VRFs in brief:

```
switch# show ipv6 ospfv3 interface brief all-vrfs
VRF : default                         Process : 1
===================================================

Total Number of Interfaces: 2

Flags: P - Passive  A - Active


Interface     Area                Cost      State              Status      Flags
---------------------------------------------------------------------------------
1/3/10        0.0.0.0             100       DR                 Up          A
1/3/11        0.0.0.1             100       BDR                Up          A
```

Showing overview information for OSPFv3 enabled interfaces for all VRFs:

```
6200(config)# show ipv6 ospfv3 interface br all-vrfs
VRF : default                         Process : 1
===================================================

Total Number of Interfaces: 1

Flags: P - Passive  A - Active


Interface     Area                Cost      State              Status      Flags
---------------------------------------------------------------------------------
1/1/1         0.0.0.0             100       BDR                Up          A
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.09	Output of the **show ipv6 ospfv3 interface** command includes flags to indicate whether the interface is in passive or active mode.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 lsdb

```
show ipv6 ospfv3 [<process-id>] lsdb
   adv-router {<ROUTER-ID>|self}
   area <AREA-ID>
   lsid <link-state-id>
   all-vrfs|vrf <VRF-NAME>}
      as-external
      asbr-summary
      database-summary
      inter-area-prefix
      inter-area-router
      intra-area-prefix
      link
      network
      nssa-external
      router
      summary
   vsx-peer
```

Description

Shows the OSPFv3 link state database summary for different OSPF LSAs (Link State Advertisement). Use the parameters to get information for a particular LSA.

Parameter	Description
`<PROCESS-ID>`	Enter an OSPFv3 process ID to display general OSPF information for a particular OSPF process. Range: 1 to 65535.
`adv-router {<ROUTER-ID>|self}`	Select to display link states for a particular advertising router. Specify either a Router ID of the advertising router or specify **self** to show self-originated link states.
`area <AREA-ID>`	Select to display information filtered for the specified area in one of the following formats. OSPFv3 area identifier in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. OSPFv3 area identifier in decimal format. Value: 0 to 4294967295.
`lsid <LINK-STATE-ID>`	Select to display information filtered by link state identifier specified in IPv4 address format (A.B.C.D).
`all-vrfs|{vrf <vrf-name>`	Select **all-vrfs** to display general OSPF information for all VRFs, or use the **vrf *<VRF-NAME>*** option to display information for a specific VRF. Optionally select one of the following parameters to filter the link state database information.
`as-external`	Show external link states (LSA type 5)

Parameter	Description
`database-summary`	Select to display the count of each type of LSA and each area in the database. **NOTE:** The **database-summary** parameter does not support the **area <area-id>**, **lsid <link-state-id>** or **adv-router {<router-id>|self}** parameters.
`inter-area-prefix`	Show inter-area prefix link states (LSA type 3)
`inter-area-router`	Show inter-area router link states (LSA type 4)
`intra-area-prefix`	Show intra-area prefix link states (LSA type 9
`link`	Show link states (LSA type 8)
`network`	Show network LSAs (LSA type 2).
`nssa-external`	Show NSSA external link states (LSA type 7).
`router`	Show router LSAs (LSA type 1).
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing OSPFv3 link state database (LSDB) general information:

```
switch# show ipv6 ospfv3 lsdb
OSPF Router with ID (50.50.50.50) (Process ID 1 VRF default)
============================================================

Router Link State Advertisements (Area 0.0.0.0)
-----------------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID         Link Count  Bits
-----------------------------------------------------------------------------
40.40.40.40     930     0x80000004  0x2ea1      0            3           None
50.50.50.50     935     0x80000002  0x8b52      0            1           E
60.60.60.60     943     0x800003c5  0x9854      0            2           None

Network Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Router Count
------------------------------------------------------------------------
60.60.60.60     944     0x80000001  0x7179      1360007168  2
50.50.50.50     935     0x80000001  0x516a      19          1

Inter Area Prefix Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
------------------------------------------------------------------
40.40.40.40     929     0x80000001  0x2498      131072      FEC0:3344::/32
50.50.50.50     928     0x80000001  0x5b2f      65536       111::/64

Inter Area Router Link State Advertisements (Area 0.0.0.0)
---------------------------------------------------------------------------------
```

```
ADV Router      Age     Seq#        Checksum    LSID        Destination Router ID
---------------------------------------------------------------------------------
40.40.40.40     929     0x80000001  0x2498      1           33.33.33.33

AS External Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
------------------------------------------------------------------
40.40.40.40     264     0x80000001  0x24cc4     1           10::/64
40.40.40.40     675     0x80000001  0x5b00f     2           11::/64

NSSA External Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
------------------------------------------------------------------
3.3.3.3         264     0x80000001  0x24ac2     1           200::/64

Link-local Link State Advertisements (Area 0.0.0.0)
---------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Interface
---------------------------------------------------------------------
50.50.50.50     264     0x80000001  0x653c4     19          1/1/1

Intra Area Prefix Link State Advertisements (Area 0.0.0.0)
----------------------------------------------------------------------------------
-------------
ADV Router      Age     Seq#        Checksum    LSID        Referenced LS Type
Referenced LSID
----------------------------------------------------------------------------------
-------------
50.50.50.50     263     0x80000001  0x1da34     1           0x2001               0
50.50.50.50     264     0x80000001  0x2a45d     1           0x2002              19
```

Showing AS external link states:

```
switch# show ipv6 ospfv3 lsdb as-external
OSPF Router with ID (60.60.60.60) (Process ID 1 VRF default)
========================================================

AS External Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
------------------------------------------------------------------
40.40.40.40     264     0x80000001  0x24cc4     1           10::/64
40.40.40.40     675     0x80000001  0x5b00f     2           11::/64
```

Showing the LSDB database summary:

```
switch# show ipv6 ospfv3 lsdb database-summary
OSPF Router with ID (10.1.1.1) (Process ID 1 VRF default)
==========================================================

Area 0.0.0.0 database summary
--------------------------
LSA Type             Count
--------------------------
Router               2
Network              1
Inter Area Prefix    1
Inter Area Router    0
NSSA External        0
Link                 3
Intra Area Prefix    3
--------------------------
Total                10

Process 1 database summary
--------------------------
LSA Type             Count
--------------------------
Router               2
Network              1
Inter Area Prefix    1
Inter Area Router    0
AS External          2
NSSA External        0
Link                 3
Intra Area Prefix    3
--------------------------
Total                12
```

Showing inter-area prefix LSAs:

```
switch# show ipv6 ospfv3 lsdb inter-area-prefix
OSPF Router with ID (6.6.6.6) (Process ID 1 VRF default)
========================================================

Inter Area Prefix Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
------------------------------------------------------------------
40.40.40.40     929     0x80000001  0x2498      131072      FEC0:3344::/32
50.50.50.50     928     0x80000001  0x5b2f      65536       111::/64
```

Showing network LSAs:

```
switch# show ipv6 ospfv3 lsdb network
OSPF Router with ID (50.50.50.50) (Process ID 1 VRF default)
========================================================

Network Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Router Count
------------------------------------------------------------------------
60.60.60.60     944     0x80000001  0x7179      1360007168  2
50.50.50.50     935     0x80000001  0x516a      19          1
```

Showing NSSA external link states:

```
switch# show ipv6 ospfv3 lsdb nssa-external
OSPF Router with ID (2.2.2.1) (Process ID 1 VRF default)
========================================================

NSSA External Link State Advertisements (Area 0.0.0.0)
------------------------------------------------------------------
ADV Router      Age     Seq#        Checksum    LSID        Prefix
```

```
-----------------------------------------------------------------
3.3.3.3         264     0x80000001  0x24ac2     1           200::/64
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 neighbors

```
show ipv6 ospfv3 [<PROCESS-ID>] neighbors [<NEIGHBOR-ID>]
     [interface <INTERFACE-NAME>] [detail | summary]
     [all-vrfs | vrf <VRF-NAME>]
```

Description

Shows information about OSPFv3 neighbors.

Parameter	Description
<PROCESS-ID>	Specifies an OSPFv3 process ID to show OSPFv3 neighbor information for the particular OSPFv3 process. Range: 1 to 65535.
neighbors *<NEIGHBOR-ID>*	Shows information about a particular neighbor, specified in IPv4 format (A.B.C.D).
interface *<INTERFACE-NAME>*	Shows neighbor information only for the specified interface.
detail	Shows detailed information for the neighbors.
summary	Shows summary information for the neighbors.
all-vrfs	Shows neighbor information for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Examples

On the 6400 Switch Series, interface identification differs.

Showing OSPFv3 neighbors information:

Showing OSPFv3 neighbors information for a specific neighbor:

```
switch# show ipv6 ospfv3 neighbors 3.3.3.3
VRF : default                         Process : 1
--------------------------------------------------------------
Router-Id         : 3.3.3.3           Area              : 0.0.0.0
Interface         : 1/1/1             Address           :
fe80::7272:cfff:fe79:7510
State             : FULL              Neighbor Priority : 1
Dead Timer Due    : 00:00:36          Options           : 0x13
Time since last state change : 00h:14m:45s
```

Showing detail OSPFv3 neighbors information for a specific neighbor:

```
switch# show ipv6 ospfv3 neighbors 2.2.2.2 detail
VRF : default                         Process : 1
--------------------------------------------------------------
Router-Id         : 3.3.3.3           Area              : 0.0.0.0
Interface         : 1/1/1             Address           :
fe80::7272:cfff:fe79:7510
State             : FULL              Neighbor Priority : 1
DR                : 3.3.3.3           BDR               : 1.1.1.3
Dead Timer Due    : 00:00:36          Options           : 0x13
Retransmission Queue Length  : 0
Time Since Last State Change : 00h:14m:45s
```

Showing OSPFv3 neighbors information for interface **1/1/1**:

```
switch# show ipv6 ospfv3 neighbors 3.3.3.3 interface 1/1/1
VRF : default                         Process : 1
--------------------------------------------------------------
Router-Id         : 3.3.3.3           Area              : 0.0.0.0
Interface         : 1/1/1             Address           :
fe80::7272:cfff:fe79:7510
State             : FULL              Neighbor Priority : 1
Dead Timer Due    : 00:00:36          Options           : 0x13
Time Since Last State Change : 00h:14m:45s
```

Showing summary OSPFv3 neighbors information for a specific neighbor for all VRFs:

```
switch# show ipv6 ospfv3 neighbors 3.3.3.3 summary all-vrfs
OSPFv3 Process ID 1 VRF default, Neighbor Summary
==================================================

Interface    Down Attempt Init TwoWay ExStart Exchange Loading Full Total
--------------------------------------------------------------------------
1/1/1        0    0       0    0      0       0        0       1    1
Total        0    0       0    0      0       0        0       1    1

OSPFv3 Process ID 1 VRF red, Neighbor Summary
==============================================

Interface    Down Attempt Init TwoWay ExStart Exchange Loading Full Total
--------------------------------------------------------------------------
1/1/2        0    0       0    0      0       0        0       1    1
Total        0    0       0    0      0       0        0       1    1
```

Showing OSPFv3 neighbors information for VRF red:

```
switch# show ipv6 ospfv3 neighbors vrf red
OSPFv3 Process ID 2 VRF red
============================

Total Number of Neighbors: 1

Neighbor ID      Priority  State             Interface
-------------------------------------------------------
4.4.4.4          1         FULL/DR           1/1/2
  Neighbor address fe80::7272:cfff:fe79:7510
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 routes

```
show ipv6 ospfv3 [<PROCESS-ID>] routes [<PREFIX/LENGTH>]
     [all-vrfs | vrf <VRF-NAME>]
```

Description

Shows the OSPFv3 routing table information.

Parameter	Description
<PROCESS-ID>	Specifies an OSPFv3 process ID that shows information from the OSPFv3 routing table for the particular OSPFv3 process. Range: 1 to 65535.
<PREFIX/LENGTH>	Specifies the IPv6 destination prefix showing information about a particular destination prefix. For example, 2010:bd9::/32.
all-vrfs	Select to show OSPFv3 routing table information for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Examples

On the 6400 Switch Series, interface identification differs.

Showing OSPFv3 routing table information:

```
switch# show ipv6 ospfv3 routes
Codes: i - Intra-area route, I - Inter-area route
       E1 - External type-1, E2 - External type-2

OSPFv3 Process ID 1 VRF default, Routing Table
-----------------------------------------------

Total Number of OSPFv3 Routes : 2

111::/64            (i) area:0.0.0.0
     directly attached to interface 1/1/1, cost 1 distance 110
fd00::/64           (i) area:0.0.0.1
     directly attached to interface vlan10, cost 1 distance 110
```

Showing OSPFv3 routing table information for VRF red:

```
switch# show ipv6 ospfv3 routes vrf red

Codes: i - Intra-area route, I - Inter-area route
       E1 - External type-1, E2 - External type-2

OSPFv3 Process ID 2 VRF red, Routing Table
-------------------------------------------

Total Number of OSPFv3 Routes : 1

222::/64            (i) area:0.0.0.1
     directly attached to interface 1/1/2, cost 1 distance 110
```

Showing OSPFv3 routing table information for destination prefix fd00::/64:

```
switch# show ipv6 ospfv3 1 routes fd00::/64
Codes: i - Intra-area route, I - Inter-area route
       E1 - External type-1, E2 - External type-2

OSPFv3 Process ID 1 VRF default, Routing Table for prefixes fd00::/64
----------------------------------------------------------------------

Total Number of OSPFv3 Routes : 1

fd00::/64           (i) area:0.0.0.1
     directly attached to interface vlan10, cost 1 distance 110
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 statistics

```
show ipv6 ospfv3 [<PROCESS-ID>] statistics
     [all-vrfs | vrf <VRF-NAME>]
```

Description

Shows OSPFv3 statistics.

Parameter	Description
<PROCESS-ID>	Specifies an OSPFv3 process ID that shows information on the OSPFv3 SPF statistics for the particular OSPFv3 process. Range: 1 to 65535.
`all-vrfs`	Select to show OSPFv3 SPF statistics information for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Examples

Showing OSPFv3 statistics information:

```
switch# show ipv6 ospfv3 statistics
OSPFv3 Process ID 1 VRF default, Statistics (cleared 3h 2m 21s ago)
---------------------------------------------------------------------

Unknown Interface Drops          : 0
Unknown Virtual Interface Drops : 0
Bad IPv6 Header Length Drops     : 0
Wrong OSPFv3 Version Drops       : 0
Bad Source IPv6 Drops            : 0
Resource Failure Drops           : 0
Bad Header Length Drops          : 0
Total Drops                      : 0
```

Showing OSPFv3 statistics information for VRF red:

```
switch# show ipv6 ospfv3 2 statistics vrf red

OSPFv3 Process ID 2 VRF red, Statistics (cleared 3h 2m 30s ago)
-----------------------------------------------------------------

Unknown Interface Drops          : 0
Unknown Virtual Interface Drops : 0
Bad IPv6 Header Length Drops     : 0
Wrong OSPFv3 Version Drops       : 0
Bad Source IPv6 Drops            : 0
```

```
Resource Failure Drops           : 0
Bad Header Length Drops          : 0
Total Drops                      : 0
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 statistics interface

```
show ipv6 ospfv3 [<PROCESS-ID>] statistics interface [<INTERFACE-NAME>]
     [all-vrfs | vrf <VRF-NAME>]
```

Description

Shows the OSPFv3 statistics for the OSPFv3-enabled interfaces.

Parameter	Description
<PROCESS-ID>	Specifies an OSPFv3 process ID to show OSPF-enabled interface statistics information on the specified OSPFv3 process. Range: 1 to 65535.
<INTERFACE-NAME>	Selects to show information only for the specified interface.
`all-vrfs`	Select to show OSPF-enabled interface statistics information for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Example

Showing OSPFv3-enabled interfaces information for interface 1/1/1:

```
switch# show ipv6 ospfv3 statistics interface all-vrfs
OSPFv3 Process ID 1 VRF default, Interface vlan2000 Statistics  (cleared 0h 2m 52s
ago)
```

```
==================================================================================
====

Tx Hello packets      : 0                 Rx Hello packets      : 0
Tx Hello bytes        : 0                 Rx Hello bytes        : 0
Tx DD packets         : 0                 Rx DD packets         : 0
Tx DD bytes           : 0                 Rx DD bytes           : 0
Tx LS request packets : 0                 Rx LS request packets : 0
Tx LS request bytes   : 0                 Rx LS request bytes   : 0
Tx LS update packets  : 0                 Rx LS update packets  : 0
Tx LS update bytes    : 0                 Rx LS update bytes    : 0
Tx LS ack packets     : 0                 Rx LS ack packets     : 0
Tx LS ack bytes       : 0                 Rx LS ack bytes       : 0

Total IPsec packets processed : 0
Total IPsec bytes processed   : 0
Total Number of State Changes : 0
Number of LSAs                : 0
LSA Checksum Sum              : 0

Total OSPFv3 Packets Discarded: 0
----------------------------------

Reason                           Packets Dropped
--------------------------------------------------
Invalid Type                     0
Invalid Length                   0
Invalid Version                  0
Bad or Unknown Source            0
Area Mismatch                    0
Self-originated                  0
Duplicate Router ID              0
Interface Standby                0
Total Hello Packets Dropped      0
  Hello Interval Mismatch        0
  Dead Interval Mismatch         0
  Options Mismatch               0
  MTU Mismatch                   0
  Neighbor Ignored               0
Resource Failures                0
Bad LSA Length                   0
Others                           0
IPsec Authentication Errors      0
IPsec ESP Errors                 0

Total LSAs Ignored : 0
-----------------------
Bad Type           : 0
Bad Length         : 0
Invalid Data       : 0
Invalid Checksum   : 0
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 ospfv3 virtual-links

```
show ipv6 ospfv3 [<PROCESS-ID>] virtual-links [brief]
   [all-vrfs | vrf <vrf-name>]
```

Description

Displays the current state and parameters of the OSPFv3 virtual links.

Parameter	Description
<PROCESS-ID>	Enter an OSPFv3 process ID to display information on the OSPFv3 virtual links for the particular OSPFv3 process. Range: 1 to 65535.
brief	Select to display brief overview information for the OSPFv3 virtual links.
all-vrfs	Select to display OSPFv3 virtual links information for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.

Examples

Show OSPFv3 virtual links information:

```
switch# show ipv6 ospfv3 virtual-links
Virtual link to router 4.4.4.4 is down
---------------------------------------

Process ID 1 VRF default, Transit area 0.0.0.1
Transit delay 1 sec
Timer Intervals: hello 10, dead 40, retransmit 5
Number of Link LSAs: 0, checksum sum 0
0 state changes
AH Authentication: MD5, SPI: 256
```

Show brief overview information for OSPFv3 virtual links:

```
switch# show ospfv3 virtual-links brief
OSPFv3 Process ID 1 VRF default
```

```
================================

Total Number of Virtual Links: 1

Remote Router    Transit Area      Status
------------------------------------------
4.4.4.4          0.0.0.1           down
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.14	Supported process ID range expanded from 1-63 to 1-65535.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

summary-address

```
summary-address  <IPV6-ADDR>/<MASK> [no-advertise | tag <TAG-VALUE>]
no summary-address <prefix/length> [no-advertise | tag <tag-value>
```

Description

Summarizes the external routes with the matching address and mask. When advertising this route, its metric is set to the lowest cost path from among the routes that were summarized.

The **no** form of this command disables route summarization.

This command only works for an ASBR (Autonomous System Boundary Router).

Parameter	Description
<IPV6-ADDR>	Specifies an IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
no-advertise	Do not advertise the aggregate route. Suppress routes that match the specified prefix/mask pair.

Parameter	Description
`tag <TAG-VALUE>`	Specify the tag for the aggregate route. The summary prefix will be advertised along with the tag value in External LSAs. Range: 0 to 4294967295

Examples

Setting OSPF route summarization:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# summary-address 2001:DB8::1/32
```

Disabling route summarization:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no summary-address 2001:DB8::1/32
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

timers lsa-arrival

```
timers lsa-arrival <DELAY>
no timers lsa-arrival
```

Description

Configures the minimum delay between receiving the same LSA from a peer. The same LSA is an LSA that contains the same LSA ID number, LSA type, and advertising router ID. If an instance of the same LSA arrives sooner before the delay expires, the LSA is dropped. Generally, the LSA arrival timer should be set to a value less than or equal to the start-time value for the command **timers throttle lsa start** on the neighbor.

The **no** form of this command sets the LSA timers to default values.

Parameter	Description
<DELAY>	Specifies the delay in milliseconds. Range: 0 to 600000. Default: 1000.

Examples

Setting the LSA arrival timer:

```
switch(config)# router ospf 1
switch(config-ospfv3-1)# timers lsa-arrival 10
```

Setting the LSA arrival timer to default:

```
switch(config)# router ospf 1
switch(config-ospfv3-1)# no timers lsa-arrival
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-ospfv3-*<PROCESS-ID>*	Administrators or local user group members with execution rights for this command.

timers throttle lsa

```
timers throttle lsa start-time <START-TIME> hold-time <HOLD-TIME> max-wait-time <WAIT-TIME>
no timers throttle lsa
```

Description

Configures the timers for LSA generation.

The **no** form of this command sets the LSA timers to default values.

Parameter	Description
start-time *<START-TIME>*	Specifies the initial wait time in milliseconds after which LSAs are generated. When set to 0, the LSAs are generated without any delay. Range: 0 to 600000. Default: 5000.

Parameter	Description
`hold-time <HOLD-TIME>`	Specifies the amount of time, in milliseconds, between regeneration of an LSA. The hold time doubles each time the same LSA must be regenerated, until **max-wait-time** is reached. When set to 0, LSA regeneration time is not increased. Range: 0 to 600000. Default: 0.
`max-wait-time <WAIT-TIME>`	Specifies the maximum wait time, in milliseconds, for regeneration of the same LSA. When set to 0, LSA regeneration time is not increased. Range: 0 to 600000. Default: 0.

Examples

Setting the LSA timers:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# timers throttle lsa start-time 100 hold-time 1000 max-
wait-time 10000
```

Setting LSA timers to default values:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no timers throttle lsa
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

timers throttle spf

```
timers throttle spf start-time <START-TIME> hold-time <HOLD-TINME>
max-wait-time <WAIT-TIME>
no timers throttle spf
```

Description

Configures timers for SPF calculation. There are three timers:

- **start-time** Is the initial delay before an SPF calculation is started. Default is 200 milliseconds.
- **hold-time** Is the progressive backoff time to wait before next scheduled SPF calculation. Default is 1000 milliseconds. If a route change event occurs during this period, the value doubles until it reaches the *max-wait-time*.
- **max-wait-time** Is the maximum time to wait before the next scheduled SPF calculation. Default is 5000 milliseconds. This is used to limit the SPF hold timer and also defines the time to be considered for which the OSPF LSDB has to be stable, after which the SPF throttle mechanism is reset.

The **no** form of this command sets all the configured non-default timers to default value.

Parameter	Description
<START-TIME>	Time in milliseconds to set timer for initial SPF delay. Default: 200.
<HOLD-TINME>	Time in milliseconds to set the minimum hold time between two consecutive SPF calculations. Default: 1000.
<WAIT-TIME>	Time in milliseconds to set the maximum wait time between two consecutive SPF calculations. Default: 5000.

Examples

Setting non-default timer values for SPF throttling:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# timers throttling spf start-time 500 hold-time 3000 max-
wait-time 9000
Switch(config-ospfv3-1)# show running-config current-context
router ospfv3 1
               area 0.0.0.0
               area 0.0.0.1
               area 0.0.0.2 nssa no-summary
               area 0.0.0.3 stub
```

Setting default timer values for SPF throttling after configuring non-default values:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no timers throttling spf
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.

transit-delay

```
transit-delay <DELAY>
no transit-delay
```

Description

Sets the time delay in Link state transmission for virtual links.

The **no** form of this command sets the delay in Link state transmission to the default of 1 second for virtual links.

Parameter	Description
<DELAY>	Specifies the time delay for the transit delay, in seconds. Range: 1 to 3600. Default: 1.

Examples

Setting OSPFv3 virtual links transit delay:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# transit-delay 30
```

Setting OSPFv3 virtual links transit delay to default:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# area 100 virtual-link 100.0.1.1
switch(config-router-vlink6)# no transit-delay
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-router-vlink`	Administrators or local user group members with execution rights for this command.

trap-enable

```
trap-enable
no trap-enable
```

Description

Enables the notification of the events to be sent as traps to the SNMP management stations for OSPFv3.

The **no** form of this command disables the notification of the events to be sent as traps to the SNMP management stations for OSPFv3.

Examples

Enabling sending notification of events as traps:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# trap-enable
```

Disabling sending notification of events as traps:

```
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# no trap-enable
```

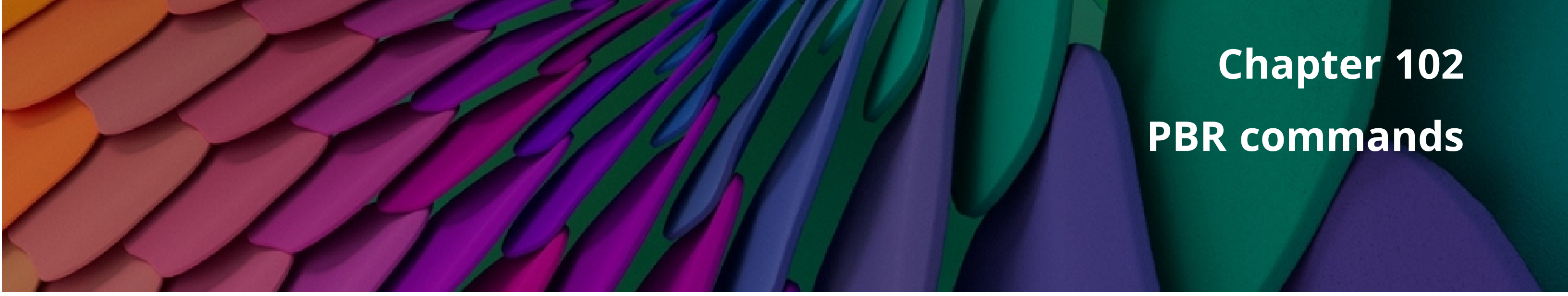
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-ospfv3-<PROCESS-ID>`	Administrators or local user group members with execution rights for this command.



Chapter 102
PBR commands

apply policy

```
apply policy <POLICY-NAME> routed-in
no apply policy <POLICY-NAME> routed-in
```

Description

Applies a classifier policy containing a PBR action to an interface. A policy with PBR actions is only applicable to L3/routing interfaces.

The **no** form of this command removes a classifier policy containing a PBR action from an interface.

`config-if`

Parameter	Description
<POLICY-NAME>	Specifies name of the policy.

Restrictions

- Only Layer 3 interfaces are valid for PBR policy application, and only in the routed inbound direction.
- If a policy with an 'interface tunnel' PBR action is applied on a Layer 3 interface in VRF 'A', and that interface tunnel is a member of VRF 'B', the interface tunnel is considered down/unavailable in this policy application in VRF 'A'.

Usage

To use route-only ports (ROPs) as Layer 3 interfaces, an internal VLAN range must be configured first. A policy with PBR actions can be applied to ROPs.

Example

On the 6400 Switch Series, interface identification differs.

Applying a policy to an interface:

```
switch(config)# interface 1/1/10
switch(config-if)# routing
switch(config-if)# apply policy pbr_policy routed-in
switch(config-if)# exit
```

Applying a policy to a subinterface, inbound direction:

```
switch(config)# interface 1/1/1.0
switch(config-if)# apply policy my_policy in
switch(config-if)# exit
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

pbr-action-list

```
pbr-action-list <ACTION-LIST-NAME>

    [<SEQUENCE-NUMBER>]
      {nexthop | default-nexthop} <NEXT-HOP-IP-ADDR>
       interface {null | <TUNNEL-NAME>}

    no [<SEQUENCE-NUMBER>]
      {nexthop | default-nexthop} <IP-ADDR>
       interface {null | <TUNNEL-NAME>}

no pbr-action-list <ACTION-LIST-NAME>
```

Description

Creates a PBR action list or modifies its entries.

The **no** form of this command can be used to delete an action list or an individual action list entry.

Parameter	Description
<ACTION-LIST-NAME>	Specifies the action list name. An action list name can be 1 to 64 alphanumeric characters.
<SEQUENCE-NUMBER>	Specifies list entry sequence number. Range: 1-4294967295 {nexthop | default-nexthop} Selects a regular next-hop (**nexthop**) or a default next-hop (**default-nexthop**). These parameters specify the address of a next-hop router to forward traffic matched by a class under different conditions.
`nexthop`	Sets the next hop for routing the packet.
`default-nexthop`	Sets the next hop for routing the packet when there is no explicit route for its destination.
<NEXTHOP-IP-ADDR>	Specifies IPv4 or IPv6 address of the next-hop router.
`interface {null	<TUNNEL-NAME>`	Selects the type of keyword interface: **null** or the tunnel interface

Parameter	Description
	name.
`null`	Specifies to drop matching traffic.
`<TUNNEL-NAME>`	Specifies an IP tunnel interface name through which to forward the matching traffic.

Restrictions

The reachability of the next-hop routers/tunnel interfaces in the list is not guaranteed. Such reachability can change at any time due to the dynamic nature of the network environment.

Usage

Each action list may contain up to eight entries of four different entry types:

- `interface null`
- `interface tunnel`
- `nexthop`
- `default-nexthop`

List entries have a unique sequence number which, if not user specified, are automatically assigned beginning at 10 and continuing at intervals of 10 for each subsequent new list entry, for example 20, 30, and 40. Sequence numbers of any value can be specified manually, a different interval may be set, and new entries can be added to (or removed from) any location in the list at any time.

Specifying an existing sequence number causes the existing list entry to be replaced by the new details. The list entry with the lowest sequence number has the highest priority entry in the list. The sequence numbers may be renumbered with the pbr-action-list resequence command.

Only one next-hop router or interface from the list is used per packet matched. This router or interface is defined as the highest priority list entry that is reachable or available at the time of the traffic match. If the highest priority list entry next-hop router or tunnel interface is reachable - that list entry is chosen, the search is stopped, and the traffic is forwarded to the next-hop router or interface for the entry. If the highest priority list entry next-hop router or tunnel interface is not reachable, the next highest priority list entry reachability is determined and used if reachable, otherwise the process continues down the list. If none of the routers in the list are reachable, the packet may be dropped (through the null interface entry if configured) or forwarded according to a system route table entry.

An action list that contains a next-hop of one IP version cannot also contain an entry of another IP version. For example, an action list must contain only IPv4 or IPv6 next-hop addresses or tunnel interfaces.

Examples

The list name is included in the context prompt for easy current-list identification. Any list name over 10 characters will be truncated at 10 characters and terminated with the tilde character (~) to indicate a reduced list name display. This reduction affects the prompt display of the list name only:

```
switch(config)# pbr-action-list eighteenchars
switch(config-pbr-action-list-eighteench~)#
```

The following example creates an action list with two IPv4 next-hops, a default IPv4 next-hop, and a null interface. The example uses default sequence numbering for its list entries.

```
switch(config)# pbr-action-list test1
switch(config-pbr-action-list-test1)# nexthop 1.1.1.1
switch(config-pbr-action-list-test1)# nexthop 2.2.2.2
switch(config-pbr-action-list-test1)# default-nexthop 9.9.9.9
switch(config-pbr-action-list-test1)# interface null
switch(config-pbr-action-list-test1)# end

switch(config)# show pbr-action-list test1


           Name
  Sequence Type                            Address/Interface
------------------------------------------------------------------
           test1
       10  nexthop                         1.1.1.1
       20  nexthop                         2.2.2.2
       30  default-nexthop                 9.9.9.9
       40  interface                       null
```

The following example creates an action list with an IPv4 next-hop and a tunnel interface with manual sequence numbers for its entries.

```
switch(config)# pbr-action-list test2
switch(config-pbr-action-list-test2)# 6 ip default-nexthop 4.4.4.4
switch(config-pbr-action-list-test2)# 1 interface tunnel10
switch(config-pbr-action-list-test2)# end

switch(config)# show pbr-action-list test2

           Name
  Sequence Type                            Address/Interface
------------------------------------------------------------------
           test2
        1  interface                       tunnel10
        6  default-nexthop                 4.4.4.4
```

The following example creates an action list with two IPv4 tunnel interfaces, with default sequence numbering.

```
switch(config)# pbr-action-list test3
switch(config-pbr-action-list-test3)# interface tunnel10
switch(config-pbr-action-list-test3)# interface tunnel15
switch(config-pbr-action-list-test3)# end

switch(config)# show pbr-action-list test3

           Name
  Sequence Type                            Address/Interface
------------------------------------------------------------------
           test3
       10  interface                       tunnel10
       20  interface                       tunnel15
```

The following example creates an action list with two IPv6 next-hops and the null interface, with manual sequence numbers.

```
switch(config)# pbr-action-list test4
switch(config-pbr-action-list-test4)# 5 nexthop 2000:abcd::cccc:dddd
switch(config-pbr-action-list-test4)# 6 nexthop 1000:abcd::1234:5678
switch(config-pbr-action-list-test4)# 7 interface null
switch(config-pbr-action-list-test4)# end

switch(config)# show pbr-action-list test4

           Name
  Sequence Type                            Address/Interface
------------------------------------------------------------------
           test4
        5  nexthop                         2000:abcd::cccc:dddd
        6  nexthop                         1000:abcd::1234:5678
        7  interface                       null
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config` The `pbr-action-list` *`<ACTION-LIST-NAME>`* command takes you into the `config-pbr-action-list-`*`<ACTION-LIST-NAME>`* context where you modify entries for a PBR action list.	Administrators or local user group members with execution rights for this command.

pbr-action-list copy

`pbr-action-list <ACTION-LIST-NAME> copy <DESTINATION-ACTION-LIST-NAME>`

Description

Copies an existing PBR action list.

Parameter	Description
`<ACTION-LIST-NAME>`	Specifies the action list name to be copied.
`<DESTINATION-ACTION-LIST-NAME>`	Specifies the name of the copied action list. A destination action list name can be 1 to 64 alphanumeric characters.

Examples

The following example copies test4 action list to test 5.

```
switch(config)# show pbr-action-list test4

           Name
  Sequence Type                            Address/Interface
-------------------------------------------------------------------
           test4
         5  nexthop                         2000:abcd::cccc:dddd
         6  nexthop                         1000:abcd::1234:5678
         7  interface                       null

switch(config)# pbr-action-list test4 copy test5
switch(config-pbr-action-list-test4)# show pbr-action-list test5

           Name
  Sequence Type                            Address/Interface
-------------------------------------------------------------------
           test4
         1  nexthop                         2000.abcd::cccc.dddd
        11  nexthop                         1000.abcd::1234.5678
        21  interface                       null
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

pbr-action-list resequence

`pbr-action-list <ACTION-LIST-NAME> resequence <STARTING-SEQUENCE-NUMBER> <INCREMENT>`

Description

Renumbers the entries in an action list. The list entry with the lowest sequence number has the highest priority entry in the list.

Parameter	Description
<ACTION-LIST-NAME>	Specifies the action list name to have its entries resequenced.

Parameter	Description
<STARTING-SEQUENCE-NUMBER>	Specifies the starting sequence number. Range: 1-4294967295
<INCREMENT>	Specifies the increment of the resequencing. Range: 1-4294967295

Examples

The following command shows how a PBR action list is resequenced. In the following example, an action list named **test4** is resequenced so that instead of its entries starting at 5 and being numbered sequentially, its entries start now at 1 and they are numbered in increments of 10:

```
switch(config)# show pbr-action-list test4

           Name
  Sequence Type                            Address/Interface
------------------------------------------------------------------
           test4
        5  nexthop                         2000.abcd::cccc.dddd
        6  nexthop                         1000.abcd::1234.5678
        7  interface                       null

switch(config)# pbr-action-list test4 resequence 1 10

           Name
  Sequence Type                            Address/Interface
------------------------------------------------------------------
           test4
        1  nexthop                         2000.abcd::cccc.dddd
       11  nexthop                         1000.abcd::1234.5678
       21  interface                       null
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

pbr-action-list reset

`pbr-action-list <ACTION-LIST-NAME> reset`

Description

Resets a specified PBR action list to its last successful configuration.

Parameter	Description
<ACTION-LIST-NAME>	Specifies the action list name to be reset.

Examples

```
switch(config)# pbr-action-list test reset
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

policy

```
policy <POLICY-NAME>

    [<SEQUENCE-NUMBER>]
      class {ip|ipv6|mac} <CLASS-NAME>
      action {<REMARK-ACTIONS> | <POLICE-ACTIONS> | <OTHER-ACTIONS>}
      [{<REMARK-ACTIONS> | <POLICE-ACTIONS> | <OTHER-ACTIONS>}]

    [<SEQUENCE-NUMBER>]
    comment ...

no policy <POLICY-NAME>
```

Description

Creates, modifies, or deletes a classifier policy. A policy contains one or more policy entries ordered and prioritized by sequence numbers. Each entry has an IPv4/IPv6/MAC class and one or more policy actions associated with it. An applied policy processes a packet sequentially against policy entries in the list until the last entry in the list has been evaluated or the packet matches an entry. If a match occurs the related entry, actions are taken.

The **no** form of this command is used to delete a policy or an individual policy entry.

Parameter	Description
<POLICY-NAME>	Specifies the name of the policy.
<SEQUENCE-NUMBER>	Specifies a sequence number for the policy entry. Optional. Range: 1 to 4294967295.
`comment`	Stores the remaining entered text as a policy entry comment.
`class {ip|ipv6|mac}` *<CLASS-NAME>*	Specifies a type of class, **ip** for IPv4, **ipv6** for IPv6 and **mac** for a MAC policy. And specifies a class name.
<REMARK-ACTIONS>	Remark actions can be any of the following options: **{pbr <ACTION-LIST> | pcp <PRIORITY> | ip-precedence <IP-PRECEDENCE-VALUE> | dscp <DSCP-VALUE> | local-priority <LOCAL-PRIORITY-VALUE>}** where: pbr *<ACTION-LIST>* Specifies the PBR action list to be used. pcp *<PCP-VALUE>* Specifies Priority Code Point (PCP) value. Range: 0 to 7. ip-precedence *<IP-PRECEDENCE-VALUE>* Specifies the numeric IP precedence value. Range: 0 to 7. dscp *<DSCP-VALUE>* Specifies a Differentiated Services Code Point (DSCP) value. Enter either a numeric value (0 to 63) or a keyword as follows: **AF11** - DSCP 10 (Assured Forwarding Class 1, low drop probability) **AF12** - DSCP 12 (Assured Forwarding Class 1, medium drop probability) **AF13** - DSCP 14 (Assured Forwarding Class 1, high drop probability) **AF21** - DSCP 18 (Assured Forwarding Class 2, low drop probability) **AF22** - DSCP 20 (Assured Forwarding Class 2, medium drop probability) **AF23** - DSCP 22 (Assured Forwarding Class 2, high drop probability) **AF31** - DSCP 26 (Assured Forwarding Class 3, low drop probability) **AF32** - DSCP 28 (Assured Forwarding Class 3, medium drop probability) **AF33** - DSCP 30 (Assured Forwarding Class 3, high drop probability) **AF41** - DSCP 34 (Assured Forwarding Class 4, low drop probability) **`AF42`** - DSCP 36 (Assured Forwarding Class 4, medium drop probability) **AF43** - DSCP 38 (Assured Forwarding Class 4, high drop probability) **CS0** - DSCP 0 (Class Selector 0: Default) **CS1** - DSCP 8 (Class Selector 1: Scavenger) **CS2** - DSCP 16 (Class Selector 2: OAM) **CS3** - DSCP 24 (Class Selector 3: Signaling) **CS4** - DSCP 32 (Class Selector 4: Real time) **CS5** - DSCP 40 (Class Selector 5: Broadcast video)

Parameter	Description
	CS6 - DSCP 48 (Class Selector 6: Network control) **CS7** - DSCP 56 (Class Selector 7) **EF** - DSCP 46 (Expedited Forwarding) `local-priority` *<LOCAL-PRIORITY-VALUE>* Specifies a local priority value. Range: 0 to 7.
<POLICE-ACTIONS>	Police actions can be the following **{cir <RATE-BPS> cbs <BYTES> exceed}** where: `cir` *<RATE-BPS>* Specifies a Committed Information Rate value in Kilobits per second. Range: 1 to 4294967295. `cbs` *<BYTES>* Specifies a Committed Burst Size value in bytes. Range: 1 to 4294967295. `exceed` Specifies action to take on packets that exceed the rate limit.
<OTHER-ACTIONS>	Other actions can be the following: `drop` Specifies drop traffic.

Restrictions

MAC classes are not applicable to policies containing PBR actions. Applying such policies to an interface are blocked.

Usage

- For Policy Based Routing, the policy action keyword is **pbr** which itself takes the name of a PBR action list as a parameter.
- A policy entry that contains a PBR action can contain other action types as well.
- An applied policy processes a packet sequentially against policy entries in the list until the last policy entry in the list has been evaluated or the packet matches an entry.
- Entering an existing **<POLICY-NAME>** value will cause the existing policy to be modified, with any new **<SEQUENCE-NUMBER>** value creating an additional policy entry, and any existing **<SEQUENCE-NUMBER>** value replacing the existing policy entry with the same sequence number.
- If no sequence number is specified, a new policy entry is appended to the end of the entry list with a sequence number equal to the highest policy entry currently in the list plus 10.

Examples

Create a policy with two PBR actions:

```
switch(config)# policy pbr_policy
switch (config-policy)# 10 class ip v4_class action pbr action_list1
switch (config-policy)# 20 class ipv6 v6_class action pbr action_list2
switch (config-policy)# exit
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config` The `policy` command takes you into the `config-policy` context where you enter the policy entries.	Administrators or local user group members with execution rights for this command.

show pbr

```
show pbr {interface <INTERFACE-NAME>|vrf <VRF-NAME>|summary}
```

Description

Shows a detailed view of Policy Based Routing (PBR) in the system.

Parameter	Description
<VRF-NAME>	Specifies name of a VRF.
<INTERFACE-NAME>	Specifies an interface. Format: **member/slot/port**.

Usage

Show commands can only reference the default VRF.

Examples

Showing PBR summary information when there is no active next-hop in the system:

```
switch# show pbr summary
VRF      Port   Policy    PBR      Seq  Type       Nexthop
---------------------------------------------------------------------
No active PBR nexthop found
---------------------------------------------------------------------
```

Showing PBR summary information when there are active next-hops in the system:

```
switch# show pbr summary

VRF      Port   Policy    PBR      Seq  Type       Nexthop
---------------------------------------------------------------------
default  1/1/1  policy_1  pbr_1    10   nexthop    1.1.1.1 (active)
         1/1/2  policy_2  pbr_2    20   nexthop    5.5.5.5 (active)
---------------------------------------------------------------------
```

Showing PBR summary information when displaying a policy with a **pbr-action-list** applied on a VxLAN L3VNI:

```
switch# configure terminal
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 10000
switch(config-vni-10000)# apply policy p1 routed-in
switch(config-vni-10000)# show pbr summary
VRF
      Port
                Policy
                          Class
                                    PBR
                                           Sequence  Type          Nexthop
-------------------------------------------------------------------------------
red
      vni10000
                p1
                          c1
                                    pbr1
                                                 10  nexthop       11.2.1.4
(active)
-------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show pbr-action-list

```
show pbr-action-list [<ACTION-LIST-NAME>] [commands] [configuration] [vsx-peer]
```

Description

Shows the current PBR action list configuration. Action list entries are displayed in ascending order of their sequence number.

Parameter	Description
<ACTION-LIST-NAME>	Specifies the PBR action list name.

Parameter	Description
`commands`	Formats output as CLI commands.
`configuration`	Displays user-specified configuration.
`vsx-peer`	Displays VSX peer switch information.

Restrictions

If an action list entry is modified to an invalid value (for example through the REST interface), this command will indicate a mismatch for that action entry when run. In this event, use the **pbr-action-list <NAME> reset** command to restore it to the previous valid value.

Usage

- This command does not indicate whether the action list is configured in a policy or applied to an interface. Use the **show pbr** command for PBR status involving action lists.
- A single action list is shown by specifying its name or you can show all action lists by omitting a name argument.
- Using the additional commands keyword, you can change the tabulated output to a configuration style output for single or all list display.

Examples

Create two PBR action lists then run **show pbr-action-list** to display all configured action lists in the default configuration mode:

```
switch(config)# pbr-action-list v4_pbr
switch(config-pbr-action-list-v4_pbr)# 1 nexthop 1.1.1.1
switch(config-pbr-action-list-v4_pbr)# 5 default-nexthop 2.2.2.2
switch(config-pbr-action-list-v4_pbr)# 10 interface null
switch(config-pbr-action-list-v4_pbr)# exit
switch(config)#
switch(config)# pbr-action-list v6_pbr
switch(config-pbr-action-list-v6_pbr)# 20 nexthop 2000:abcd::cccc:dddd
switch(config-pbr-action-list-v6_pbr)# 40 default-nexthop 1000:abcd::1234:5678
switch(config-pbr-action-list-v6_pbr)# 60 interface null
switch(config-pbr-action-list-v6_pbr)# exit
switch#

switch# show pbr-action-list
           Name
           Additional PBR-Action-List Parameters
Sequence     Type                 Nexthop
-----------------------------------------------------------------------------------
-----
             v4_pbr
1            nexthop              1.1.1.1
5            default-nexthop      2.2.2.2
10           interface            null

             v6_pbr
20           nexthop              2000:abcd::cccc:dddd
40           default-nexthop      1000:abcd::1234:5678
60           interface            null
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-config current-context

`show running-config current-context`

Description

Displays the configuration of the PBR action list in the current configuration context, in commands mode.

Parameter	Description
`running-config`	Shows configuration currently running on switch.
`current-context`	Limits display to current config context only, in commands mode.

Usage

Useful for reexamining entries previously entered into the action list after its entries have scrolled off the terminal due to other output or upon reentering the context of an existing action list.

Examples

Creating two PBR action lists and running **show running-configuration curent-context** to display the action list configuration in commands mode:

```
switch(config)# pbr-action-list v4_pbr
switch(config-pbr-action-list-v4_pbr)# 1 nexthop 1.1.1.1
switch(config-pbr-action-list-v4_pbr)# 5 default-nexthop 2.2.2.2
switch(config-pbr-action-list-v4_pbr)# 10 interface null
switch(config-pbr-action-list-v4_pbr)# exit
switch(config)#
switch(config)# pbr-action-list v6_pbr
switch(config-pbr-action-list-v6_pbr)# 20 nexthop 2000:abcd::cccc:dddd
switch(config-pbr-action-list-v6_pbr)# 40 default-nexthop 1000:abcd::1234:5678
switch(config-pbr-action-list-v6_pbr)# 60 interface null
switch(config-pbr-action-list-v6_pbr)#
switch(config-pbr-action-list-v6_pbr)# show running-config current-context
```

```
pbr-action-list v6_pbr
    20 nexthop 2000:abcd::cccc:dddd
    40 default-nexthop 1000:abcd::1234:5678
    60 interface null
```

Switching context back to the first actionl ist and running the same command:

```
switch(config-pbr-action-list-v6_pbr)# pbr-action-list v4_pbr
switch(config-pbr-action-list-v4_pbr)#
switch(config-pbr-action-list-v4_pbr)# show running-config current-context
pbr-action-list v4_pbr
    1 nexthop 1.1.1.1
    5 default-nexthop 2.2.2.2
    10 interface null
```

Removing action list entry number 5 and running the command again:

```
switch(config-pbr-action-list-v4_pbr)# no 5
switch(config-pbr-action-list-v4_pbr)# show running-config current-context
pbr-action-list v4_pbr
    1 nexthop 1.1.1.1
    10 interface null
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

Chapter 103
PIM-DM commands for IPv4

disable

`disable`

Description

Disables PIM globally on the router. PIM is disabled by default.

Using the **disable** command will cause all the multicast routes to be erased from hardware.

Example

Disabling PIM router:

```
switch(config)# router pim
switch(config-pim)# disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables PIM globally on the router.

Example

Enabling PIM router:

```
switch(config)# router pim
switch(config-pim)# enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

ip pim-dense

```
ip pim-dense {enable|disable}
no ip pim-dense [enable]
```

Description

Enables or disables PIM-DM in the current interface. PIM-DM is disabled by default on an interface. IP address must be configured on the interface to enable PIM-DM.

Parameter	Description
`enable`	Specifies PIM-DM on the interface. IP address must be configured on the interface to enable PIM-DM (use the **ip address <A.B.C.D/M>** command).
`disable`	Disables PIM-DM on the interface.

Examples

Enabling and disabling PIM-DM in an interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip address 40.0.0.4/24
switch(config-if-vlan)# ip pim-dense enable
switch(config-if-vlan)#
switch(config-if-vlan)# ip pim-dense disable
```

Enabling and disabling PIM-DM in a sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip address 10.0.0.1/24
switch(config-subif)# ip pim-dense enable
switch(config-subif)#
switch(config-subif)# ip pim-dense disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense bfd

```
ip pim-dense bfd [disable]
no ip pim-dense bfd
```

Description

Configures BFD on a per-interface basis for an interface associated with the PIM process.

The **no** form of this command removes the BFD configuration on the interface and sets it to the default configuration.

If BFD is enabled globally, it will be enabled by default on all interfaces. The only exception is when it is disabled specifically on an interface using the **ip pim-dense bfd disable** command.

If BFD is disabled globally, it will be disabled by default on all interfaces. The only exception is when it is enabled specifically on an interface using the **ip pim-dense bfd** command.

Parameter	Description
`disable`	Disables the BFD configuration on the interface.

Examples

Enabling the BFD configuration on the interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense bfd
```

Removing the BFD configuration on the interface:

```
switch(config-if-vlan)# no ip pim-dense bfd
```

Disabling the BFD configuration on the interface and overriding the global setting:

```
switch(config-if-vlan)# ip pim-dense bfd disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip pim-dense graft-retry-interval

```
ip pim-dense graft-retry-interval <INTERVAL-VALUE>
no ip pim-dense graft-retry-interval
```

Description

Configures the interval for which the routing switch waits for the graft acknowledgment from another router before resending the graft request.

The **no** form of this command removes the currently configured value and sets to the default of 3 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the interval the routing switch waits for the graft acknowledgment. Default: 3 seconds. Range: 1-10 seconds.

Usage

Graft packets result when a downstream router transmits a request to join a flow. The upstream router responds with a graft acknowledgment packet. If the graft acknowledgment is not received within the time period of the graft-retry-interval, it resends the graft packet.

Example

Configuring and removing dense graft retry interval on the interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense graft-retry-interval 5
switch(config-if-vlan)# no ip pim-dense graft-retry-interval
```

Configuring and removing dense graft retry interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360 and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense graft-retry-interval 5
switch(config-subif)#
switch(config-subif)# no ip pim-dense graft-retry-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense hello-delay

```
ip pim-dense hello-delay <DELAY-VALUE>
no ip pim-dense hello-delay
```

Description

Configures the maximum time in seconds before the router actually transmits the initial PIM hello message on the current interface.

The **no** form of this command removes currently configured value and sets to the default of 5 seconds.

Parameter	Description
<DELAY-VALUE>	Specifies the hello-delay in seconds, which is the maximum time before a triggered PIM Hello message is transmitted on this interface. Default: 5 seconds. Range: 0-5 seconds.

Usage

In cases where a new interface activates connections with multiple routers, if all the connected routers send hello packets at the same time, the receiving router could become momentarily overloaded. This command randomizes the transmission delay to a time between zero and the hello delay setting. Using zero means no delay. After the router sends the initial hello packet to a newly detected interface, it sends subsequent hello packets according to the current hello interval setting.

Example

Configuring and removing hello-delay on the interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense hello-delay 4
switch(config-if-vlan)# no ip pim-dense hello-delay
```

Configuring and removing hello-delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360 and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense hello-delay 4
switch(config-subif)#
switch(config-subif)# no ip pim-dense hello-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense hello-interval

```
ip pim-dense hello-interval <INTERVAL-VALUE>
no ip pim-dense hello-interval
```

Description

Configures the frequency at which the router transmits PIM hello messages on the current interface.

The **no** form of this command removes the currently configured value and sets to the default of 30 seconds.

Parameter	Description
<INTERVAL-VALUE>	Required: Specifies the frequency at which PIM Hello messages are transmitted on this interface. Default: 30 seconds. Range: 5-300 seconds.

Usage

- The router uses hello packets to inform neighbor routers of its presence.
- The router also uses this setting to compute the hello holdtime, which is included in hello packets sent to neighbor routers.
- Hello holdtime tells neighbor routers how long to wait for the next hello packet from the router. If another packet does not arrive within that time, the router removes the neighbor adjacency on that interface from the PIM adjacency table, which removes any flows running on that interface.
- Shortening the hello interval reduces the hello holdtime. If they do not receive a new hello packet when expected, it changes how quickly other routers stop sending traffic to the router.

Example

Configuring and removing dense hello-interval:

```
switch(config)# interface 1/1/4
switch(config-if)# ip pim-dense hello-interval 60
switch(config-if)# no ip pim-dense hello-interval
```

Configuring and removing dense hello-interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-subif)# interface 1/1/10.10
switch(config-subif)# ip pim-dense hello-interval 60
switch(config-subif)#
switch(config-subif)# no ip pim-dense hello-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense ip-addr

```
ip pim-dense ip-addr {<IP-ADDR-VALUE> | any}
no ip pim-dense ip-addr
```

Description

Enables the router to dynamically determine the source IP address to use for PIM packets sent from the interface or to use the specific IP address.

The **no** form of this command removes the currently configured value and sets to the default of **any**.

Parameter	Description
<IP-ADDR-VALUE>	Specifies an IP address as the source IP for the interface.
`any`	Specifies dynamically determining the source IP from the current IP address of the interface.

Examples

Configuring and removing source IP address:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense ip-addr 40.0.0.4
switch(config-if-vlan)# no ip pim-dense ip-addr
```

Configuring and removing source IP address on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360 and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense ip-addr 10.1.1.1
switch(config-subif)#
switch(config-subif)# no ip pim-dense ip-addr
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense lan-prune-delay

```
ip pim-dense lan-prune-delay
no ip pim-dense lan-prune-delay
```

Description

Enables the LAN prune delay option on the current interface. The default status is enabled.

The **no** form of this command disables the LAN prune delay option.

Usage

With LAN-prune-delay enabled, the router informs downstream neighbors how long it will wait before pruning a flow after receiving a prune request. Other downstream routers on the same interface must send a join to override the prune before the LAN-prune-delay time to continue the flow. Prompts any downstream neighbors with multicast receivers continuing to belong to the flow to reply with a join. If no joins are received after the LAN-prune-delay period, the router prunes the flow. The propagation-delay and override-interval settings determine the LAN-prune-delay setting.

Example

Enabling and disabling the LAN prune delay:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense lan-prune-delay
switch(config-if-vlan)# no ip pim-dense lan-prune-delay
```

Enabling and disabling the LAN prune delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense lan-prune-delay
switch(config-subif)# no ip pim-dense lan-prune-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense max-graft-retries

```
ip pim-dense max-graft-retries <ATTEMPT-VALUE>
no ip pim-dense max-graft-retries
```

Description

Configures the number of attempts the routing switch will retry sending the same graft packet to join a flow.

The **no** form of this command removes the currently configured value and sets to the default of 3 attempts.

Parameter	Description
<INTERVAL-VALUE>	Specifies the number of retries for the routing switch to resend the graft packet. Default: 3 attempts. Range: 1-10 attempts.

Usage

If a graft acknowledgment response is not received after the specified number of retries, the routing switch ceases trying to join the flow. In this case the flow is removed until either a state-refresh from upstream re-initiates the flow or an upstream router floods the flow. Increasing this value helps to improve multicast reliability.

Example

Configuring and removing dense graft retry interval:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense max-graft-retries 6
switch(config-if-vlan)# no ip pim-dense max-graft-retries
```

Configuring and removing dense graft retry interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360 and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense max-graft-retries 6
switch(config-subif)#
switch(config-subif)# no ip pim-dense max-graft-retries
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense override-interval

```
ip pim-dense override-interval <INTERVAL-VALUE>
no ip pim-dense override-interval
```

Description

Configures the override interval that gets inserted into the Override Interval field of a LAN Prune Delay option.

The **no** form of this command removes the currently configured value and sets the value to the default of 2500 ms.

Parameter	Description
<INTERVAL-VALUE>	Specifies the override interval of a LAN Prune Delay option in ms. Default: 2500 ms. Range: 500-6000.

Usage

Each router on the LAN expresses its view of the amount of randomization necessary in the Override Interval field of the LAN Prune Delay option. When all routers on a LAN use the LAN Prune Delay Option, all routers on the LAN MUST set their Override_Interval to the largest Override value on the LAN.

Example

Configuring and removing the override interval:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense override-interval 4000
switch(config-if-vlan)# no ip pim-dense override-interval
```

Configuring and removing the override interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense override-interval 4000
switch(config-subif)# no ip pim-dense override-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense propagation-delay

```
ip pim-dense propagation-delay <DELAY-VALUE>
no ip pim-dense propagation-delay
```

Description

Configures the propagation delay that gets inserted into the LAN prune delay field of a LAN Prune Delay option.

The **no** form of this command removes currently configured value and sets to the default of 500 ms.

Parameter	Description
<DELAY-VALUE>	Specifies the propagation delay value in ms. Default: 500 ms. Range: 250-2000 ms.

Usage

The LAN Delay inserted by a router in the LAN Prune Delay option expresses the expected message propagation delay on the link. When all routers on a link use the LAN Prune Delay Option, all routers on the LAN MUST set Propagation Delay to the largest LAN Delay on the LAN.

Examples

Configuring and removing the propagation delay:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense propagation-delay 400
switch(config-if-vlan)# no ip pim-dense propagation-delay
```

Configuring and removing the propagation delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense propagation-delay 400
switch(config-subif)# no ip pim-dense propagation-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-dense ttl-threshold

```
ip pim-dense ttl-threshold <THRESHOLD-VALUE>
no ip pim-dense ttl-threshold
```

Description

Configures the multicast datagram time-to-live (router hop-count) threshold for the interface. A state-refresh packet with a TTL less than this threshold will not be forwarded out the interface.

The **no** form of this command removes the currently configured value and sets to the default of 3 attempts.

Parameter	Description
<THRESHOLD-VALUE>	Specifies the time to live threshold. Default: 3 attempts. Range: 0-255.

Usage

The interface connected to the multicast source does not receive state refresh packets and thus is not state-refresh capable. Downstream VLANs in the switches are state-refresh capable. This parameter provides a method for containing multicast traffic within a network, or even within specific areas of a network. Initially, the multicast traffic source sets a TTL value in the packets it transmits. Each time one of these packets passes through a multicast routing device, the TTL setting decrements by 1. If the packet arrives with a TTL lower than the ttl-threshold, the routing switch does not forward the packet. The following aspects of the TTL setting of incoming multicast packets must be considered, before changing this parameter on a routing switch:

- A value that is too high will allow multicast traffic to go beyond the internal network.
- A value that is too low may prevent some intended hosts from receiving the desired multicast traffic.
- A value of 0 will forward multicast traffic regardless of the packet TTL setting.

Example

Configuring and removing the time-to-live threshold:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ip pim-dense ttl-threshold 8
switch(config-if-vlan)# no ip pim-dense ttl-threshold
```

Configuring and removing the time-to-live threshold on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip pim-dense ttl-threshold 8
switch(config-subif)#
switch(config-subif)# no ip pim-dense ttl-threshold
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

router pim

```
router pim [vrf <VRF-NAME>]
  accept-register access-list <ACL-RULE>
  accept-rp <IP-ADDR> access-list <ACL-RULE>
  active-active
  bfd all-interfaces
  bsr-candidate {bsm-interval <INTERVAL-VALUE> | {hash-mask-length <LENGTH-VALUE> |
  priority <PRIORITY-VALUE> | source-ip-interface <INTERFACE-NAME>}
  enable|disable
  join-prune-interval <INTERVAL-VALUE>
  multicast-route-limit <limit>
  no ...
  register-rate-limit <limit>
  rp-address <IP-ADDR> [<GRP-ADDR/GRP-MASK>] [override]
  rp-candidate {group-prefix <GRP-ADDR/GRP-MASK>  |hold-time <TIME-VALUE> | priority
  <PRIORITY-VALUE> | source-ip-interface <INTERFACE-NAME> [group-prefix <GRP-ADDR/GRP-
  MASK>]}
  rpf-override <SRC-ADDR/SRC-MASK><RPF-ADDR|INTERFACE-NAME>
```

Description

Changes the current context to the PIM configuration context and enables PIM globally on the router. If no VRF is specified, the default VRF is assumed.

The **no** form of this command removes the PIM configuration from the specified context or the default VRF.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the name of a VRF.
`accept-register access-list <ACL-RULE>`	Specify an ACL rule name to configures ACL on RP to filter PIM Register packets from unauthorized sources. The ACL specified will contain the (S,G) traffic in register packets to permitted or denied.
`accept-rp <IP-ADDR> access-list <ACL-RULE>`	Specify the IPv4 address of the static RP and ACL rule name to enable the PIM router to filter PIM join/prune messages destined for a specific RP and specific groups. The ACL specifies the group addresses which are allowed or denied. Up to 8 RP addresses and group ACL can be associated with the PIM router. PIM will store the accepted RP address and the associated group ACL. When a join or prune message is received, a RP look up is made for the packet. If the RP is in the configured list and if the group in the join/prune packet is allowed in the ACL, the packet is allowed. Otherwise the packet is dropped.

Parameter	Description
	To allow join/prune message from any groups, group address in the ACL can be wild-carded. In this case, only RP address check is performed. This parameter impacts only (*,G) join/prune messages. If there are any existing flows, the user will need to disable and enable PIM on the interface to apply the ACL. Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements. When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received. **NOTE:** If there is an active flow which is in the SPT, the traffic flow through the SPT will continue. Only (*,G) join/prune messages are dropped. (S,G) join/prune messages will not be impacted.
`active-active`	Enables the PIM active-active mechanism per VRF on VSX. The default is disabled. PIM active-active keeps the multicast forwarding state synchronized on both VSX peer devices. Synchronization is achieved by electing the VSX peer that has the highest IP address as a designated router (DR) and the other as Proxy-DR. If you want the multicast traffic to flow through VSX primary, assign higher IP addresses to the interfaces in VSX primary. When the VSX peer that is acting as the DR goes down, traffic is recovered faster since the multicast routes are synchronized.
`bfd all-interfaces`	Enables BFD on all PIM interfaces. BFD can be disabled at individual PIM interface using the **ip pim-sparse bfd disable** command.
`bsr-candidate`	Configure settings for a router that operates as the BSR in a domain.
`bsm-interval <INTERVAL-VALUE>`	Configures the interval in seconds to send periodic RP-Set messages to all PIM-SM interfaces on a router that operates as the BSR in a domain. This setting must be smaller than the **rp-candidate hold-time** settings (range of 30 to 255; default 150) configured in the RPs operating in the domain. Default: 60 seconds. Range: 5-300.
`hash-mask-length <LENGTH-VALUE>`	Controls the distribution of multicast groups among the C-RP, in a domain where there is overlapping coverage of the groups among the RPs. This value specifies the length (number of significant bits) when allocating this distribution. A longer hash-mask-length results in fewer multicast groups, for each block of group addresses assigned to the RPs. Multiple blocks of addresses assigned to each C-RP results in wider dispersal of addresses. Includes

Parameter	Description
	enhanced load-sharing for the multicast traffic for the different groups that are used in the domain at the same time. Default: 30 bits. Range: 1-32.
`priority <PRIORITY-VALUE>`	Configures the priority to apply to the router when a BSR election process occurs in the PIM-SM domain. The candidate with the highest priority becomes the BSR for the domain. If the highest priority is shared by multiple routers, the candidate having the highest IP address becomes the BSR of the domain. Zero (0) is the lowest priority. To make BSR selection easily predictable, use this command to assign a different priority to each candidate BSR in the PIM-SM domain. Default: 0. Range: 0-255
`source-ip-interface <INTERFACE-NAME>`	Configures the router to advertise itself as a candidate PIM-SM BSR on the interface specified, and enables BSR candidate operation. The result makes the router eligible to be elected as the BSR for the PIM-SM domain in which it operates. One BSR candidate interface is allowed per-router. The Interface can be a VLAN interface (such as vlan15) or routed interfaces (such as lag 1 or 1 / 1 / 19). PIM-SM must be enabled on this interface (use the **ip pim-sparse enable** command).
`enable|disable`	Enables or disables PIM globally on the router.
`join-prune-interval <INTERVAL-VALUE>`	Configures the frequency at which the router will send periodic join or prune-interval messages. Range 5 to 65535 Default: 60.
`multicast-route-limit <limit>`	Configures the limit on the maximum number of multicast route entries that can be programmed. When the limit is configured, multicast route entries created because of IGMP or MLD membership reports, and multicast route entries created because of multicast streams are restricted to the configured limit. Flows exceeding the configured multicast route limit will be programmed as a bridge entry and will not have the outgoing interfaces list populated. This configuration prevents creation of new multicast routes when limits are reached. At the time of configuration, if the device has more multicast routes than the configured limit, existing multicast routes continue to exist until they are removed. The flows are programmed in the HW on a FCFS basis. There could be scenarios where the flow is forwarded in neighbor router, but it may not be forwarded on the current router because of exceeding the limits configured on the current router. In such cases, it is recommended to configure higher limits to avoid traffic outage. Range: 1 to 4294967295.

Parameter	Description
`no...`	Negates any configured parameter.
`register-rate-limit <limit>`	Configures the limit on the maximum number of register messages sent per second for every unique (S,G) entry. By default, there is no maximum rate set. When the limit is configured, register messages generation is limited to the configured value. Range: 1 to 4294967295.
`rp-address`	Statically configures the router as the RP for a specified multicast group or range of multicast groups. When a static RP and a C-RP are configured to support the same multicast groups and the multicast group mask for the static RP is equal to or greater than the same mask for the applicable C-RPs, this command assigns the higher precedence to the static RP, resulting in the C-RP operating only as a backup RP for the configured group. Without override, the C-RP has precedence over a static RP configured for the same multicast group or groups. This must be configured on all PIM-SM routers in the domain. If group address is not specified, it applies to all IPv4 multicast addresses (224.0.0.0 - 239.255.255.255). PIM-SM supports a maximum of 8 static RPs per VRF.
`<IP-ADDR>`	Specifies the address of the static RP in IPv4 format (**x.x.x.x**).
`<GRP-ADDR/GRP-MASK>`	Specifies the multicast group address in IPv4 format (**x.x.x.x**) and the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`override`	Specifies higher precedence to static RP over Candidate RP.
`rp-candidate`	Configure Candidate Rendezvous Point (C-RP) settings.
`group-prefix <GRP-ADDR/GRP-MASK>`	Adds multicast group address to the current Candidate Rendezvous Point (C-RP) configuration by specifying the the multicast group address in IPv4 format (**x.x.x.x**) and the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`hold-time <TIME-VALUE>`	Changes the hold-time a C-RP includes in its advertisements to the BSR. Hold-time is included in the advertisements the C-RP periodically sends to the elected BSR for the domain. Also updates the BSR on how long to wait after the last advertisement from the reporting RP before assuming it has become unavailable. Range: 30 to 250. Default: 150.
`priority <PRIORITY-VALUE>`	Changes the current priority setting for a C-RP. Where multiple C-RP configurations are used to support the same multicast groups, the candidate

Parameter	Description
	having the highest priority is elected. Zero (0) is the highest priority, and 255 is the lowest priority. Range: 0 to 255. Default: 192.
`source-ip-interface`	Enables the Candidate Rendezvous Point (C-RP) operation, and configures the router to advertise itself as a C-RP to the Bootstrap Router (BSR) for the current domain. This step includes the option to allow the C-RP to be a candidate for all possible multicast groups, or for up to four multicast groups, or ranges of groups. If group-prefix is not given, it considers for all multicast group addresses.
`<INTERFACE-NAME>`	Specifies the interface to use as a source for the C-RP router IP address.
`group-prefix <GRP-ADDR/GRP-MASK>`	Specifies the multicast group address in IPv4 format (**x.x.x.x**) and the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`rpf-override`	The Reverse Path Forward (RPF) override allows overriding the normal RPF lookup mechanism, and indicates to the router that it may accept multicast traffic on an interface other than the one that the RPF lookup mechanism would normally select. This includes accepting traffic from an invalid source IP address for the subnet or VLAN that is directly connected to the router. Traffic may also be accepted from a valid PIM neighbor that is not on the reverse path towards the source of the received multicast traffic.
`<SRC-ADDR/SRC-MASK>`	Specifies the multicast source IPv4 address in IPv4 format (**x.x.x.x**) and the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`<RPF-ADDR|INTERFACE-NAME>`	Specifies the RPF override IP address or interface.

Usage

When a register ACL is associated with a PIM Router, the PIM protocol will store the source and destination address details along with the action (permit or deny). If there are any existing flows, the user will need to disable and enable PIM on the interface to apply the ACL.

Upon receiving the register messages, a look up is made to check if the S and G in the packet is in the permitted list. If there is no match or if there is a deny rule match, a register stop message is immediately sent and the packet is dropped and no further action is taken. Permitted packets will go through the normal flow.

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

Recommendations for the active-active mechanism:

- Do not configure the DR priority of interfaces when **active-active** is enabled. The DR priority will be set to high on DR and default on Proxy-DR and any user-configured DR priority will be ignored.
- Always configure **keepalive** between VSX peers. If the ISL goes down when **keepalive** is not configured, both VSX peers start acting independently as DRs, resulting in duplicate traffic.
- Do not configure IGMP joins on transit VLANS.
- RP redundancy is not supported on the **active-active** mechanism. If one of the VSX peers is configured as RP and it goes down, the new traffic flows will not be converged until the RP is elected. For a static RP, new flows will never be converged until the VSX peer is back up.

Reverse Path Forward (RPF) override usage details:

- Reverse Path Forward (RPF) checking is a core multicast routing mechanism. The RPF ensures that the multicast traffic received arrives on the expected router interface before further processing. If the RPF check fails for a multicast packet, the packet is discarded. For multicast traffic flow that arrives on the SPT, the expected incoming interface for a given source or group is the interface towards the source address of the traffic (determined by the unicast routing system). For traffic arriving on the RP tree, the expected incoming interface is the interface towards the RP.
- RPF checking is applied to all multicast traffic and is significant in preventing network loops. Up to eight manual RPF overrides can be specified. The RPF-address indicates one of two distinct RPF candidates:
    1. A valid PIM neighbor address from which forwarded multicast traffic is accepted with a source address of ***<source-addr/src-mask>***.
    2. A local router address on a PIM-enabled interface to which ***<source-addr/src-mask>*** is directly connected. If configured, the local router will assume the role of DR for this flow and registers the flow with an RP.

Examples

Configuring and enabling default router PIM:

```
switch(config)# router pim
switch(config-pim)#enable
```

Configuring specified router PIM:

```
switch(config)# router pim vrf green
switch(config-pim)#
```

Configuring ACL on RP with an ACL rule named **pim_reg_acl**:

```
switch(config)# access-list ip pim_reg_acl
switch(config-acl-ip)# 10 permit any 20.1.1.1 225.1.1.2
switch(config-acl-ip)# 20 deny any 30.1.1.1 225.1.1.3
switch(config)# router pim
switch(config-pim)# accept-register acces
```

Configuring ACL on a RP with an ACL rule named **pim_rp_grp_acl** to filter join/prune messages:

```
switch(config)# access-list ip pim_rp_grp_acl
switch(config-acl-ip)# 10 permit any any 225.1.1.2/255.255.255.0
switch(config-acl-ip)# 20 permit any any 239.1.1.2/255.255.255.0
switch(config)-acl-ip# router pim
switch(config-pim)# accept-rp 30.1
```

On the 6400 Switch Series, interface identification differs.

Configuring and removing the BSR-candidate interface:

```
switch(config)# router pim
switch(config-pim)# bsr-candidate source-ip-interface 1/1/4
switch(config-pim)# bsr-candidate source-ip-interface vlan5
switch(config-pim)# no rp-candidate source-ip-interface 1/1/4
```

Configuring and removing sub-interface 1/1/4.10 as the BSR-candidate:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# router pim
switch(config-pim)# bsr-candidate source-ip-interface 1/1/4.10
switch(config-pim)#
switch(config-pim)# no rp-candidate source-ip-interface 1/1/4.10
```

Configuring and removing the multicast route rate limit:

```
switch(config)# router pim
switch(config-pim)# multicast-route-limit 1024
switch(config-pim)# no multicast-route-limit
```

Configuring and removing the register rate limit:

```
switch(config)# router pim
switch(config-pim)# register-rate-limit 10
switch(config-pim)# no register-rate-limit
```

Configuring and removing candidate-RP router priority and hold times

```
switch(config)# router pim
switch(config-pim)# rp-candidate priority 250
switch(config-pim)# rp-candidate hold-time 200
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ip mroute

`show ip mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows mroute information for all VRFs. Optional.
`vrf <VRF-NAME>`	Shows mroute information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF. Optional.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing IP mroute for all VRFs:

```
switch# show ip mroute  all-vrfs
VRF : blue
Total number of entries : 1

Group Address            : 239.1.1.1
Source Address           : 40.0.0.5
Incoming interface       : vlan3
Downstream Interface
Interface    State
---------    -----
vlan2        forwarding

VRF : green
Total number of entries : 2

Group Address            : 239.1.1.1
Source Address           : 40.0.0.4
Neighbor                 : 10.1.1.1
Incoming interface       : vlan2
Downstream Interface
Interface    State
---------    -----
vlan5        forwarding

Group Address            : 239.1.1.1
```

```
Source Address          : 40.0.0.5
Neighbor                : 10.1.1.2
Incoming interface      : vlan1
Downstream Interface
Interface   State
---------   -----
vlan6       forwarding

VRF : default
Total number of entries : 1

Group Address           : 10.1.1.14
Source Address          : 40.0.0.6
Neighbor                : 10.1.1.2
Incoming interface      : 1/1/5
Downstream Interface
Interface   State
---------   -----
1/1/3       forwarding
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip mroute group-addr

`show ip mroute <GROUP-ADDR> [<SOURCE-ADDR>] [all-vrfs | vrf <vrf-name>] [vsx-peer]`

Description

Shows the multicast routing information for the given group address. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<GROUP-ADDR>	Specifies a group address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<SOURCE-ADDR>	Specifies show information for the group from this source in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.

Parameter	Description
`all-vrfs`	Shows mroute information for the group for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing information for group 239.1.1.1 and VRF green:

```
switch# show ip mroute 239.1.1.1 vrf green

VRF : green

Group Address                 : 239.1.1.1
Source Address                : 40.0.0.5
Neighbor                      : 10.1.1.2
Incoming interface            : vlan1
Unicast Routing Protocol      : connected
Metric                        : 1234
Metric  Pref                  : 1234
Downstream Interface
Interface   State
---------   -----
vlan6       forwarding
```

Showing information for group 239.1.1.1 from source 40.0.0.5 and all VRFs:

```
switch# show ip mroute 239.1.1.1 40.0.0.5 all-vrfs

VRF : blue

Group Address                 : 239.1.1.1
Source Address                : 40.0.0.5
Incoming interface            : vlan3
Unicast Routing Protocol      : connected
Metric                        : 1234
Metric  Pref                  : 1234
Downstream Interface
Interface   State
---------   -----
vlan2       forwarding


VRF : green

Group Address                 : 239.1.1.1
Source Address                : 40.0.0.5
Neighbor                      : 10.1.1.2
Incoming interface            : vlan1
Unicast Routing Protocol      : connected
Metric                        : 1234
Metric  Pref                  : 1234
Downstream Interface
```

```
Interface   State
---------   -----
vlan6       forwarding
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip mroute brief

`show ip mroute brief [al-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows brief version of the multicast routing information. Optionally, you can specify the display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows mroute information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the IP mroute brief:

```
switch# show ip mroute  brief
VRF : default
Total number of entries : 1

Group Address      Source Address     Neighbor           Interface
-------------      --------------     --------           ---------
239.1.1.1          40.0.0.6           10.1.1.2           vlan5
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim

`show ip pim [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the PIM router information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Optional. Shows PIM router information on all VRFs.
`vrf <VRF-NAME>`	Optional. Shows PIM router information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing IP PIM router:

```
switch# show ip pim

PIM Global Parameters

VRF                           :   default
PIM Status                    :   Enabled
Join/Prune Interval (sec)     :   60
SPT Threshold                 :   Enabled
State Refresh Interval (sec) :   60
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim interface

```
show ip pim interface [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the information about PIM interfaces currently configured in the router. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	(Optional) Shows PIM interface information for all VRFs.
`vrf <VRF-NAME>`	(Optional) Shows PIM interface information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows the default VRF information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM interface for the 6200, 6300, 6400,8100, 8325, 8360, 9300, 10000 switch series:

```
switch# show ip pim interface


PIM Interfaces

VRF: default
Total Number of interfaces: 1

Interface                  : vlan10
Neighbor count             : 0
IP Address                 : 100.100.1.2/24
```

```
Mode                       : bidir
Proxy DF                   : false
Hello Interval(sec)        : 30
Hello Delay(sec)           : 5
Override Interval(msec) : 2500
Lan Prune Delay            : Yes
Propagation Delay (msec): 500
Neighbor Timeout           : 0
PIM Interfaces

VRF: default

Interface           IP Address          mode
------------------- ------------------ ----------
1/1/1               40.0.0.4/24         sparse
1/1/2               50.0.0.4/24         sparse
```

Showing PIM interface:

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Added support for BIDIR PIM on the , 6300, 6400,, , , , switch series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim interface interface-name

`show ip pim interface <INTERFACE-NAME> [vsx-peer]`

Description

Shows detailed information about the PIM interface currently configured.

Parameter	Description
<INTERFACE-NAME>	Specifies an interface for showing PIM interface information. Interface can also be a LAG or VLAN.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not

Parameter	Description
	have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM interface information for interface 1/1/2:

```
switch# show ip pim interface 1/1/2

PIM Interfaces

VRF: default

Interface  : 1/1/2
IP Address : 50.0.0.4/24
Mode       : dense

Designated Router :
Hello Interval (sec)       : 30
Hello Delay (sec)          : 5
Graft Retry Interval(sec)  : 3
Max Graft Retries          : 5
SR TTL Threshold           : 8

Override Interval (msec)   : 2500              Lan Prune Delay     : Yes
Propagation Delay (msec)   : 500               DR Priority         : 1
Neighbor Timeout           : 105
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim interface interface-name counters

`show ip pim interface <INTERFACE-NAME> counters [vsx-peer]`

Description

Shows the PIM packet counters information for the specified interface.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to show packet counter information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM packet counters:

```
switch# show ip pim interface vlan1 counters
Interface              : vlan1
VRF                    : default
                                        Rx        Tx        Drops
                                        --------  --------  --------
Hello                                    21        21        0
BSM                                      12        10        0
Register                                 0         0         0
SSM Register                             5         0         0
Register Stop                            0         0         0
SSM Register Stop                        0         5         0
Join/Prune                               0         0         0
SSM Join/Prune                           2         2         0
C-RP Advertisement                       0         0         0
Graft                                    0         0         0
Graft Ack                                0         0         0
Assert                                   0         0         0
State Refresh                            0         0         0
Register Drops(Register ACL hitcount)    0         0         4
Join/Prune Drops(RP ACL hitcount)        0         0         7
Unknown Multicast                        0         0         0
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rpf

```
show ip pim rpf [<IP-ADDRESS>][all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Displays PIM RPF details for the specified source or RP address in the given VRF and shows the nexthop and interface through which the shortest path to the source is available. It also displays if a PIM neighbor is present on the nexthop. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<IP-ADDRESS>	(Optional) Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. Shows PIM RPF details for the given IP address.
`all-vrfs`	(Optional) Shows PIM interface information for all VRFs.
`vrf` *<VRF-NAME>*	(Optional) Shows PIM interface information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows the default VRF information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing PIM RPF information for the default VRF:

```
switch# show ip pim rpf
Multicast RPF Details
Origin Codes: C - connected, SM - static-multicast, SU - static-unicast
              O - OSPF, B - BGP, R - RIP
VRF: default
IP Address       RPF Interface  RPF Nexthop   PIM Neighbor  RPF Route/Mask
Origin  In Use
---------------  -------------  ------------  ------------  ---------------  -----
-  ---
1.1.1.1          vlan10         10.1.1.1      yes           1.1.1.1/32       O
  yes
10.1.1.1         vlan10                       no            10.1.1.0/24      C
  yes
10.1.1.2         vlan10                       no            10.1.1.2/32      C
  yes
```

Showing PIM RPF information for the specified IP address:

```
switch# show ip pim rpf 1.1.1.1
Multicast RPF Details
Origin Codes: C - connected, SM - static-multicast, SU - static-unicast
O - OSPF, B - BGP, R - RIP

VRF: default
IP Address   RPF Interface  RPF Nexthop  PIM Neighbor  RPF Route/Mask    Origin
In Use
-----------  -------------  -----------  ------------  ----------------  ------  -
-----
```

```
1.1.1.1      vlan10         10.1.1.1         yes       1.1.1.1/32        O
yes
```

Showing PIM RPF information for all VRFs:

```
switch# show ip pim rpf all-vrfs
Multicast RPF Details
Origin Codes: C - connected, SM - static-multicast, SU - static-unicast
O - OSPF, B - BGP, R - RIP

VRF: default
IP Address   RPF Interface  RPF Nexthop   PIM Neighbor  RPF Route/Mask  Origin  In
Use
-----------  -------------  ------------  ------------  --------------  ----    --
--
1.1.1.1      vlan10         10.1.1.1      yes           1.1.1.1/32      O
yes
10.1.1.1     vlan10                       no            10.1.1.0/24     C
yes
10.1.1.2     vlan10                       no            10.1.1.2/32     C
yes

VRF: red
IP Address   RPF Interface  RPF Nexthop   PIM Neighbor  RPF Route/Mask  Origin  In
Use
-----------  -------------  ------------  ------------  --------------  ------  --
----
2.2.2.2      vlan20         20.0.0.1      yes           2.2.2.2/32      SU
yes
20.0.0.1     vlan20                       no            20.0.0.0/24     C
yes
20.0.0.2     vlan20                       no            20.0.0.2/32     C
yes
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim neighbor

```
show ip pim neighbor [<IP-ADDRESS>] [brief | all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows PIM neighbor information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
brief	Specifies PIM neighbor information display in brief format.
all-vrfs	Selects all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM neighbor information for the , 6300, 6400,, , , , switch series.:

```
switch# show ip pim neighbor

PIM Neighbor

VRF                           : default
Total number of neighbors : 1

IP Address                    : 30.1.1.3
Interface                     : vlan30
Up Time (HH:MM:SS)            : 03:55:40
Expire Time (HH:MM:SS)        : 00:01:23
DR Priority                   : NA
Hold Time (HH:MM:SS)          : 00:01:45
Bidir Capable                 : True
```

Showing PIM neighbor information in brief for the default VRF:

```
switch# show ip pim neighbor brief
-----------------------------------------------------------------------------------
-
 VRF: default                 Total number of neighbor : 2
-----------------------------------------------------------------------------------
-
Interface    Neighbor    Uptime      Expires     DR        Hold Time   Secondary
Address
             (IPV4)     (HH:MM:SS)  (HH:MM:SS)  Priority  (HH:MM:SS)   (IPV4)
----------  --------   ---------   ---------   ------    ---------   ----------------
-
29091/1/1    40.0.0.5  11:54:21    00:01:31    NA        00:01:45    Nil
29101/1/2    50.0.0.5  00:03:23    00:01:23    NA        00:01:45
60.0.0.4,70.0.0.4
-----------------------------------------------------------------------------------
-
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Added support for BIDIR PIM on the , 6300, 6400,, , , , switch series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

state-refresh-interval

```
state-refresh <INTERVAL-VALUE>
no state-refresh
```

Description

Configures the interval between successive state-refresh messages originated by the routing switch. Only the routing switch connected directly to the multicast source initiates state-refresh packets. All other PIM routers in the network only propagate these state-refresh packets.

The **no** form of this command sets the interval to the default value of 60 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the state refresh interval in seconds. Default: 60 seconds. Range 10-100.

Examples

Configuring the state refresh interval:

```
switch(config)# router pim
switch(config-pim)# state-refresh 30
switch(config-pim)# no state-refresh
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

Chapter 104

PIM-DM commands for IPv6

disable

`disable`

Description

Disables PIMv6 globally on the router.

Using the **disable** command will cause all the multicast routes to be erased from hardware.

Example

Disabling PIM router:

```
switch(config)# router pim6
switch(config-pim6)# disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables PIMv6 globally on the router.

Example

Enabling PIM router:

```
switch(config)# router pim6
switch(config-pim6)# enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense

```
ipv6 pim6-dense {enable | disable}
no ipv6 pim6-dense [enable]
```

Description

Enables or disables PIM-DM on the current interface. PIM-DM is disabled by default on an interface. An IPv6 address must be configured on the interface to enable PIM-DM.

Parameter	Description
`enable`	Enables PIM-DM on the interface. IPv6 address must be configured on the interface to enable PIM-SM (use the **ipv6 address <X:X::X:X/M>** command).
`disable`	Disables PIM-DM on the interface.

Examples

Enabling and disabling PIM-DM on an interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 address 2001::01/64
switch(config-if-vlan)# ipv6 pim6-dense enable
switch(config-if-vlan)# ipv6 pim6-dense disable
```

Enabling and disabling PIM-DM on a sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 address 1001::01/64
switch(config-subif)# ipv6 pim6-dense enable
switch(config-subif)# ipv6 pim6-dense disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense bfd

```
ipv6 pim6-dense bfd [disable]
no ipv6 pim6-dense bfd
```

Description

Configures BFD on a per-interface basis for an interface associated with the PIM process.

The **no** form of this command removes the BFD configuration on the interface and sets it to the default configuration.

If BFD is enabled globally, it will be enabled by default on all interfaces. The only exception is when it is disabled specifically on an interface using the **ipv6 pim6-dense bfd disable** command.
If BFD is disabled globally, it will be disabled by default on all interfaces. The only exception is when it is enabled specifically on an interface using the **ipv6 pim6-dense bfd** command.

Parameter	Description
`disable`	Disables the BFD configuration on the interface.

Examples

Enabling the BFD configuration on the interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense bfd
```

Disabling the BFD configuration on the interface:

```
switch(config-if-vlan)# ipv6 pim6-dense bfd disable
```

Removing the BFD configuration on the interface:

```
switch(config-if-vlan)# no ipv6 pim6-dense bfd
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense graft-retry-interval

```
ipv6 pim6-dense graft-retry-interval <INTERVAL-VALUE>
no ipv6 pim6-dense graft-retry-interval
```

Description

Configures the interval for which the routing switch waits for the graft acknowledgment from another router before resending the graft request.

The **no** form of this command removes the currently configured value and sets to the default of 3 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the interval the routing switch waits for the graft acknowledgment. Default: 3 seconds. Range: 1-10.

Usage

Graft packets result when a downstream router transmits a request to join a flow. The upstream router responds with a graft acknowledgment packet. If the graft acknowledgment is not received within the time period of the graft-retry-interval, it resends the graft packet.

Example

Configuring and removing dense graft retry interval:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense graft-retry-interval 5
switch(config-if-vlan)# no ipv6 pim6-dense graft-retry-interval
```

Configuring and removing dense graft retry interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 pim6-dense graft-retry-interval 5
switch(config-subif)#
switch(config-subif)# no ipv6 pim6-dense graft-retry-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense hello-delay

```
ipv6 pim6-dense hello-delay <DELAY-VALUE>
no ipv6 pim6-dense hello-delay
```

Description

Configures the maximum time in seconds before the router actually transmits the initial PIM hello message on the current interface.

The **no** form of this command removes currently configured value and sets to the default of 5 seconds.

Parameter	Description
<DELAY-VALUE>	Specifies the hello-delay in seconds, which is the maximum time before a triggered PIM Hello message is transmitted on this interface. Default: 5 seconds. Range: 0-5.

Usage

- In cases where a new interface activates connections with multiple routers, if all the connected routers sent hello packets at the same time, the receiving router could become momentarily overloaded.
- This command randomizes the transmission delay to a time between zero and the hello delay setting. Using zero means no delay. After the router sends the initial hello packet to a newly detected interface, it sends subsequent hello packets according to the current hello interval setting.

Example

Configuring and removing hello-delay on the interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense hello-delay 4
switch(config-if-vlan)# no ipv6 pim6-dense hello-delay
```

Configuring and removing hello-delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 pim6-dense hello-delay 4
switch(config-subif)#
switch(config-subif)# no ipv6 pim6-dense hello-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense hello-interval

```
ipv6 pim6-dense hello-interval <INTERVAL-VALUE>
no ipv6 pim6-dense hello-interval
```

Description

Configures the frequency at which the router transmits PIM hello messages on the current interface.

The **no** form of this command removes the currently configured value and sets to the default of 30 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the frequency at which PIM Hello messages are transmitted on this interface. Default: 30 seconds. Range: 5-300.

Usage

- The router uses hello packets to inform neighbor routers of its presence.
- The router also uses this setting to compute the hello holdtime, which is included in hello packets sent to neighbor routers.
- Hello holdtime tells neighbor routers how long to wait for the next hello packet from the router. If another packet does not arrive within that time, the router removes the neighbor adjacency on that interface from the PIM adjacency table, which removes any flows running on that interface.
- Shortening the hello interval reduces the hello holdtime. If they do not receive a new hello packet when expected, it changes how quickly other routers stop sending traffic to the router.

Example

Configuring and removing dense hello-interval:

```
switch(config)# interface 1/1/4
switch(config-if)# ipv6 pim6-dense hello-interval 60
switch(config-if)# no ipv6 pim6-dense hello-interval
```

Configuring and removing dense hello-interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-subif)# interface 1/1/10.10
switch(config-subif)# ipv6 pim6-dense hello-interval 60
switch(config-subif)#
switch(config-subif)# no ipv6 pim6-dense hello-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense ipv6-addr

```
ipv6 pim6-dense ipv6-addr {<IPV6-ADDR-VALUE> | any}
no ipv6 pim6-dense ipv6-addr
```

Description

Enables the router to dynamically determine the source IP address to use for PIM packets sent from the interface or to use the specific IP address.

The **no** form of this command removes the currently configured value and sets to the default of **any**.

Parameter	Description
<IPV6-ADDR-VALUE>	Specifies an IPv6 address as the source IP for the interface.
`any`	Specifies dynamically determining the source IP from the current IPv6 address of the interface.

Examples

Configuring and removing the source IP address:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense ip-addr 2001::02
switch(config-if-vlan)# no ipv6 pim6-dense ipv6-addr
```

Configuring and removing the source IP address for the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 pim6-dense ipv6-addr 1001::01
switch(config-subif)#
switch(config-subif)# no ipv6 pim6-dense ipv6-addr
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense lan-prune-delay

```
ipv6 pim6-dense lan-prune-delay
no ipv6 pim6-dense lan-prune-delay
```

Description

Enables the LAN prune delay option on the current interface. The default status is enabled.

The **no** form of this command disables the LAN prune delay option.

Usage

With LAN-prune-delay enabled, the router informs downstream neighbors how long it will wait before pruning a flow after receiving a prune request. Other downstream routers on the same interface must send a join to override the prune before the LAN-prune-delay time to continue the flow. Prompts any downstream neighbors with multicast receivers continuing to belong to the flow to reply with a join. If no joins are received after the LAN-prune-delay period, the router prunes the flow. The propagation-delay and override-interval settings determine the LAN-prune-delay setting.

Example

Enabling and disabling the LAN prune delay:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense lan-prune-delay
switch(config-if-vlan)# no ipv6 pim6-dense lan-prune-delay
```

Enabling and disabling the LAN prune delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# no ipv6 pim6-dense lan-prune-delay
switch(config-subif)#
switch(config-subif)# ipv6 pim6-dense lan-prune-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense max-graft-retries

```
ipv6 pim6-dense max-graft-retries <ATTEMPT-VALUE>
no ipv6 pim6-dense max-graft-retries
```

Description

Configures the number of attempts the routing switch will retry sending the same graft packet to join a flow.

The **no** form of this command removes the currently configured value and sets to the default of 3 attempts.

Parameter	Description
<INTERVAL-VALUE>	Specifies the number of retries for the routing switch to resend the graft packet. Default: 3 attempts. Range: 1-10.

Usage

If a graft acknowledgment response is not received after the specified number of retries, the routing switch ceases trying to join the flow. In this case the flow is removed until either a state-refresh from upstream re-initiates the flow or an upstream router floods the flow. Increasing this value helps to improve multicast reliability.

Example

Configuring and removing the dense graft retry interval:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense max-graft-retries 6
switch(config-if-vlan)# no ipv6 pim6-dense max-graft-retries
```

Configuring and removing the dense graft retry interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 pim6-dense max-graft-retries 6
switch(config-subif)# no ipv6 pim6-dense max-graft-retries
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense override-interval

```
ipv6 pim6-dense override-interval <INTERVAL-VALUE>
no ipv6 pim6-dense override-interval
```

Description

Configures the override interval that gets inserted into the Override Interval field of a LAN Prune Delay option.

The **no** form of this command removes the currently configured value and sets the value to the default of 2500 ms.

Parameter	Description
<INTERVAL-VALUE>	Specifies the override interval of a LAN Prune Delay option in ms. Default: 2500 ms. Range: 500-6000.

Usage

Each router on the LAN expresses its view of the amount of randomization necessary in the Override Interval field of the LAN Prune Delay option. When all routers on a LAN use the LAN Prune Delay Option, all routers on the LAN MUST set their Override_Interval to the largest Override value on the LAN.

Example

Configuring and removing the override interval:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense override-interval 4000
switch(config-if-vlan)# no ipv6 pim6-dense override-interval
```

Configuring and removing the override interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 pim6-dense override-interval 4000
switch(config-subif)#
switch(config-subif)# no ipv6 pim6-dense override-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense propagation-delay

```
ipv6 pim6-dense propagation-delay <DELAY-VALUE>
no ipv6 pim6-dense propagation-delay
```

Description

Configures the propagation delay that gets inserted into the LAN prune delay field of a LAN Prune Delay option.

The **no** form of this command removes currently configured value and sets to the default of 500 ms.

Parameter	Description
<DELAY-VALUE>	Specifies the propagation delay value in ms. Default: 500 ms. Range: 250-2000.

Usage

The LAN Delay inserted by a router in the LAN Prune Delay option expresses the expected message propagation delay on the link. When all routers on a link use the LAN Prune Delay Option, all routers on the LAN MUST set Propagation Delay to the largest LAN Delay on the LAN.

Examples

Configuring and removing the propagation delay:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense propagation-delay 400
switch(config-if-vlan)# no ipv6 pim6-dense propagation-delay
```

Configuring and removing the propagation delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 pim6-dense propagation-delay 400
switch(config-subif)#
switch(config-subif)# no ipv6 pim6-dense propagation-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-dense ttl-threshold

```
ipv6 pim6-dense ttl-threshold <THRESHOLD-VALUE>
no ipv6 pim6-dense ttl-threshold
```

Description

Configures the multicast datagram time-to-live (router hop-count) threshold for the interface. Any IP multicast datagrams or state-refresh packets with a TTL less than this threshold will not be forwarded out the interface.

The **no** form of this command removes the currently configured value and sets to the default of 3 attempts.

Parameter	Description
<THRESHOLD-VALUE>	Specifies the time-to-live threshold. Default: 3 attempts. Range: 0-255.

Usage

The VLAN connected to the multicast source does not receive state refresh packets and thus is not state-refresh capable. Downstream VLANs in the switches are state-refresh capable. This parameter provides a method for containing multicast traffic within a network, or even within specific areas of a network. Initially, the multicast traffic source sets a TTL value in the packets it transmits. Each time one of these packets passes through a multicast routing device, the TTL setting decrements by 1. If the packet arrives with a TTL lower than the ttl-threshold, the routing switch does not forward the packet. The following aspects of the TTL setting of incoming multicast packets must be considered, before changing this parameter on a routing switch:

- A value that is too high will allow multicast traffic to go beyond the internal network.
- A value that is too low may prevent some intended hosts from receiving the desired multicast traffic.
- A value of 0 will forward multicast traffic regardless of the packet TTL setting.

Example

Configuring and removing the time-to-live threshold:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-dense ttl-threshold 8
switch(config-if-vlan)# no ipv6 pim6-dense ttl-threshold
```

Configuring and removing the time-to-live threshold on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ipv6 pim6-dense ttl-threshold 8
switch(config-subif)# no ipv6 pim6-dense ttl-threshold
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

no ipv6 pim6-dense

```
no ip pim-dense
```

Description

Removes PIM-DM for all IPv6 related configurations for the interface.

Examples

Removing all PIM-DM configurations on an interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# no ipv6 pim6-dense
```

Removing all PIM-DM configurations on a sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/1.10
switch(config-subif)# no ipv6 pim6-dense
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

register-source

```
register-source <INTERFACE-NAME>
no register-source <INTERFACE-NAME>
```

Description

Specifies the source interface to be used for PIM registration in the case of VXLAN anycast interfaces. When the PIM enabled anycast VLAN is directly connected to a multicast source, **register-source** is used to send registration messages to the RP and this interface receives the register-stop messages from the RP.

The **no** form of this command removes the register source configuration.

For PIMv6, both IPv6 link-local and active-gateway address of the anycast VLAN interface is configured with the anycast link-local address. Refer to **EVPN VXLAN distributed anycast gateway** in the Multicast Guide for more information.

Parameter	Description
<INTERFACE-NAME>	Specifies the name of the interface to use.

Usage

- This is a global configuration under router-pim configuration and is required in Symmetric IRB with anycast IP address configuration.
- This configuration is required in the source connected switch only when the PIM-DR and RP are in two different switches.
- Without this configuration, there will be traffic loss as the registration sequence will not be successful. It is mandatory to have this source interface configured with a non-anycast IP address which is unique to the VTEP, and with PIM enabled.

Examples

Configuring the source interface for PIM registrations:

```
switch# config
switch(config)# router pim6 vrf vrf1
switch(config-pim)# register-source loopback1
```

Removing the **register-source** configuration:

```
switch(config-pim)# no register-source loopback1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced for PIMv6.
10.09.1000	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

router pim6

```
router pim6 [vrf <VRF-NAME>]
no router pim6 [vrf <VRF-NAME>]
```

Description

Changes the current context to the PIMv6 configuration context. If no VRF is specified, the default VRF is assumed.

The **no** form of this command removes the PIM configuration from the specified context or the default VRF.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Examples

Configuring default router PIM:

```
switch(config)# router pim6
switch(config-pim6)#
```

Configuring specified router PIM:

```
switch(config)# router pim6 vrf Green
switch(config-pim6)#
```

Removing router PIM:

```
switch(config)# no router pim6
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show ipv6 pim6

```
show ipv6 pim6 [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the PIM router information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the IPv6 PIM router:

```
switch# show ipv6 pim6

PIM Global Parameters

VRF                             :  default
PIM Status                      :  Enabled
Join/Prune Interval (sec)       :  46
SPT Threshold                   :  Disabled
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 interface

`show ipv6 pim6 interface [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the information about PIM interfaces currently configured in the router. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Optional. Shows mroute information for the group for all VRFs.
`vrf <VRF-NAME>`	Optional. Shows mroute information for the group for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM interface:

```
switch# show ipv6 pim6 interface
PIM Interfaces

VRF: default

Interface          IP Address
mode
------------------ --------------------------------------------------------------
----------
1/1/1              fe80::a00:9ff:feec:dc0e/64
dense
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 interface <*INTERFACE-NAME*>

```
show ipv6 pim6 interface <INTERFACE-NAME> [vsx-peer]
```

Description

Shows detailed information about the PIM interface currently configured.

Parameter	Description
`<INTERFACE-NAME>`	Specifies an interface for showing PIM interface information. Interface can also be a LAG or VLAN.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM interface information for interface 1/1/1:

```
switch# show ipv6 pim6 interface 1/1/1

PIM Interfaces

VRF: default

Interface              : 1/1/1
IPv6 Address           : fe80::a00:9ff:feec:dc0e/64
Mode                   : dense

Designated Router      : fe80::a00:9ff:febd:8364
Hello Interval         : 30 sec
Hello Delay            : 4 sec

Override Interval      : 500 msec                LAN Prune Delay     : Yes
Propagation Delay      : 350 msec                DR Priority         : 3
Neighbor Timeout       : 0                       TTL Threshold       : 250
Graft Retry Interval   : 9                       Max Graft Retries   : 9
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rpf

`show ipv6 pim6 rpf [<IP-ADDRESS>][all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Displays PIM RPF details for the specified source or RP address in the given VRF and shows the nexthop and interface through which the shortest path to the source is available. It also displays if a PIM neighbor is present on the nexthop. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<IP-ADDRESS>	Optional. Specifies an IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F. Shows PIM RPF details for the given IP address.
all-vrfs	Optional. Shows PIM interface information for all VRFs.
vrf *<VRF-NAME>*	Optional. Shows PIM interface information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows the default VRF information.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing PIM RPF information for the VRF named 'red':

```
switch# show ipv6 pim6 rpf vrf red
Multicast RPF Details
Origin Codes: C - connected, SM - static-multicast, SU - static-unicast
O - OSPF, B - BGP, R - RIP
VRF: red
IP Address      : 2000::2
RPF Interface   : vlan20
RPF Nexthop     :
```

```
RPF Route/Mask  : 2000::2/128
Origin          : C
In Use          : yes
IP Address      : 2222::2
RPF Interface   : vlan20
RPF Nexthop     : fe80::94f1:2880:141d:a800(PIM Neighbor)
RPF Route/Mask  : 2222::2/128
Origin          : O
In Use          : yes
```

Showing PIM RPF information for the specified IP address:

```
switch# show ipv6 pim6 rpf 2222::2 vrf red
Multicast RPF Details
Origin Codes: C - connected, SM - static-multicast, SU - static-unicast
O - OSPF, B - BGP, R - RIP
VRF: red
IP Address      : 2222::2
RPF Interface   : vlan20
RPF Nexthop     : fe80::94f1:2880:141d:a800(PIM Neighbor)
RPF Route/Mask  : 2222::2/128
Origin          : O
In Use          : yes
```

Showing PIM RPF information for all VRFs:

```
switch# show ipv6 pim6 rpf all-vrfs
Multicast RPF Details

Origin Codes: C - connected, SM - static-multicast, SU - static-unicast
              O - OSPF, B - BGP, R - RIP

VRF: default
IP Address      : 1001::2
RPF Interface   : vlan10
RPF Nexthop     :
RPF Route/Mask  : 1001::2/128
Origin          : C
In Use          : yes

IP Address      : 1111::1
RPF Interface   : vlan10
RPF Nexthop     : fe80::94f1:2880:a1d:a800(PIM Neighbor)
RPF Route/Mask  : 1111::1/128
Origin          : O
In Use          : yes

VRF: red
IP Address      : 2000::2
RPF Interface   : vlan20
RPF Nexthop     :
RPF Route/Mask  : 2000::2/128
Origin          : C
In Use          : yes

IP Address      : 2222::2
RPF Interface   : vlan20
RPF Nexthop     : fe80::94f1:2880:141d:a800(PIM Neighbor)
RPF Route/Mask  : 2222::2/128
```

```
Origin            : O
In Use            : yes
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 mroute

`show ipv6 mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing IPv6 mroute information for the default VRF:

```
Switch# show ipv6 mroute
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address              : ff32::10
Source Address             : fd00:192:168:20::2
```

```
SSM Mroute               : True
Neighbor                 : fe80::f403:4301:1422:2600
Uptime                   : 00:14:05
State                    : route
Incoming interface       : 1/1/5
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding
```

Showing IPv6 mroute information for all VRFs:

```
switch# do show ipv6 mroute all-vrfs
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : ff32::10
Source Address           : fd00:192:168:2::100
SSM Mroute               : True
Neighbor                 : fe80::eceb:b801:14e4:2900
Uptime                   : 00:19:20
State                    : route
Incoming interface       : 1/1/4
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding

VRF : red
Total number of entries : 1

Group Address            : ff32::11
Source Address           : 30::3
SSM Mroute               : True
Neighbor                 : fe80::eceb:b880:1fe4:2900
Uptime                   : 00:01:13
State                    : route
Incoming interface       : vlan31
Outgoing Interface List :
Interface       State
-----------     ----------
vlan32          forwarding
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 mroute brief

```
show ipv6 mroute brief [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows brief version of the multicast routing information. Optionally, you can specify the display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows mroute information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the IPv6 mroute brief:

```
switch# show ipv6 mroute brief all-vrfs
IP Multicast Route Entries

VRF : blu
Total number of entries : 2

Group Address  : ff08::1:3
Source Address : 2002::04
Neighbor       : 2003::04
Interface       : 1/1/2

Group Address  : ff08::1:4
Source Address : 2002::03
Neighbor       : 2003::05
Interface       : 1/1/3

VRF : default
Total number of entries : 1

Group Address  : ff08::1:5
Source Address : 2001::03
Neighbor       : 2002::01
Interface       : 1/1/1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 mroute <GROUP-ADDR>

```
show ipv6 mroute <GROUP-ADDR> [<SOURCE-ADDR>]
     [all-vrfs | vrf <vrf-name>] [vsx-peer]
```

Description

Shows the multicast routing information for the given group address. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<GROUP-ADDR>	Specifies show information for the group address. Format: X:X::X:X
<SOURCE-ADDR>	Optional. Specifies show information for the group from this source. Format: X:X::X:X
all-vrfs	Optional. Shows mroute information for the group for all VRFs.
vrf *<VRF-NAME>*	Optional. Shows mroute information for the group for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing information for group ff08::1:3 and VRF green:

```
switch# show ipv6 mroute  ff08::1:3 vrf green

IP Multicast Route Entries

VRF : green

Group Address                 : ff08::1:3
Source Address                : 2001::03
Neighbor                      : 2003::04
```

```
Incoming Interface            : 1/1/1
Multicast Routing Protocol    : PIM-DM
Unicast Routing Protocol      : connected
Metric                        : 0
Metric  Pref                  : 0

Downstream Interface
Interface      State
---------      -----
1/1/4          pruned
```

Showing information for group ff08::1:3 from source 2001::03 and all VRFs:

```
switch# show ipv6 mroute  ff08::1:3 2001::03 all-vrfs

IP Multicast Route Entries

VRF : blue

Group Address                 : ff08::1:3
Source Address                : 2001::03
Neighbor                      : 2003::04
Incoming Interface            : 1/1/1
Multicast Routing Protocol    : PIM-DM
Unicast Routing Protocol      : connected
Metric                        : 0
Metric  Pref                  : 0

Downstream Interface
Interface      State
---------      -----
1/1/4          pruned

VRF : green

Group Address                 : ff08::1:3
Source Address                : 2001::03
Neighbor                      : 2003::04
Incoming Interface            : 1/1/2
Multicast Routing Protocol    : PIM-DM
Unicast Routing Protocol      : connected
Metric                        : 0
Metric  Pref                  : 0

Downstream Interface
Interface      State
---------      -----
1/1/4          pruned

VRF : red

Group Address                 : ff08::1:6
Source Address                : 2001::04
Neighbor                      : 2003::04
Incoming Interface            : 1/1/2
Multicast Routing Protocol    : PIM-DM
Unicast Routing Protocol      : connected
Metric                        : 0
Metric  Pref                  : 0

Downstream Interface
```

```
Interface      State               By_Proxy_Dr
---------      -----               -----------
vlan10         forwarding          false
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 neighbor

`show ipv6 pim6 neighbor [<IPv6-ADDR>] [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows PIM neighbor information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<IPv6-ADDR>	Specifies a neighbor address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
`all-vrfs`	Shows information for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing PIM neighbor information:

```
switch# show ipv6 pim6 neighbor
```

```
PIM Neighbor

VRF                    : default
IP Address             : 2001::02
Interface              : 1/1/1
Up Time (sec)          : 0
Expire Time (sec)      : 0
DR Priority            : 44
```

Showing PIM neighbor information (including the presence of anycast neighbors) for all VRFs:

```
switch# show ipv6 pim6 neighbor all-vrfs

PIM Neighbor


VRF                          : red
Total number of neighbors : 2

IPv6 Address                 : fe80::5:5:5:5
Interface                    : vni10000
Up Time (HH:MM:SS)           : 06:57:07
Expire Time (HH:MM:SS)       : 00:03:26
DR Priority                  : 1
Hold Time (HH:MM:SS)         : 00:03:30

IPv6 Address                 : fe80::3821:c780:a5c:18c0
Interface                    : vlan10
Up Time (HH:MM:SS)           : 00:01:46
Expire Time (HH:MM:SS)       : 00:01:29
DR Priority                  : 1
Hold Time (HH:MM:SS)         : 00:01:45
Secondary IP Addresses      :100:100::3
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

state-refresh-interval

```
state-refresh <INTERVAL-VALUE>
no state-refresh
```

Description

Configures the interval between successive state-refresh messages originated by the routing switch. Only the routing switch connected directly to the unicast source initiates state-refresh packets. All other PIM routers in the network only propagate these state-refresh packets.

The **no** form of this command sets the interval to the default value of 60 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the state refresh interval in seconds. Default: 60 seconds. Range 10-100.

Examples

Configuring the state refresh interval:

```
switch(config)# router pim6
switch(config-pim6)# state-refresh 30
switch(config-pim6)# no state-refresh
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

Chapter 105
PIM-SM commands for IPv4

accept-register access-list

```
accept-register access-list <ACL-RULE>
no accept-register access-list <ACL-RULE>
```

Description

Configures ACL on RP to filter PIM Register packets from unauthorized sources. The ACL specified will contain the (S,G) traffic in register packets to permitted or denied.

The **no** form of this command removes the currently configured ACL rule.

Parameter	Description
<ACL-RULE>	Specifies the ACL rule name.

Usage

When register ACL is associated with a PIM Router, PIM protocol will store the source and destination address details along with the action (permit or deny). If there are any existing flows, the user will need to disable and enable PIM on the interface to apply the ACL.

Upon receiving the register messages, a look up is made to check if the S and G in the packet is in the permitted list. If there is no match or if there is a deny rule match, a register stop message is immediately sent and the packet is dropped and no further action is taken. Permitted packets will go through the normal flow.

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

Examples

Configuring ACL on RP with an ACL rule named **pim_reg_acl**:

```
switch(config)# access-list ip pim_reg_acl
switch(config-acl-ip)# 10 permit any 20.1.1.1 225.1.1.2
switch(config-acl-ip)# 20 deny any 30.1.1.1 225.1.1.3
switch(config)# router pim
switch(config-pim)# accept-register access-list pim_reg_acl
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

accept-rp

```
accept-rp <IP-ADDR> access-list <ACL-RULE>
no accept-rp <IP-ADDR> access-list <ACL-RULE>
```

Description

Enables PIM router to filter PIM join/prune messages destined for a specific RP and specific groups. The ACL specifies the group addresses which are allowed or denied. Up to 8 RP addresses and group ACL can be associated with the PIM router.

The **no** form of this command removes the currently configured ACL rule.

Parameter	Description
<IP-ADDR>	Specifies the IPv4 address of the static RP. Format: A.B.C.D
<ACL-RULE>	Specifies the ACL rule name.

Usage

PIM will store the accepted RP address and the associated group ACL. When a join or prune message is received, a RP look up is made for the packet. If the RP is in the configured list and if the group in the join/prune packet is allowed in the ACL, the packet is allowed. Otherwise the packet is dropped.

To allow join/prune message from any groups, group address in the ACL can be wild-carded. In this case, only RP address check is performed.

This command impacts only (*,G) join/prune messages. If there are any existing flows, the user will need to disable and enable PIM on the interface to apply the ACL.

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

If there is an active flow which is in the SPT, the traffic flow through the SPT will continue. Only (*,G) join/prune messages are dropped. (S,G) join/prune messages will not be impacted.

Examples

Configuring ACL on a RP with an ACL rule named **pim_rp_grp_acl** to filter join/prune messages:

```
switch(config)# access-list ip pim_rp_grp_acl
switch(config-acl-ip)# 10 permit any any 225.1.1.2/255.255.255.0
switch(config-acl-ip)# 20 permit any any 239.1.1.2/255.255.255.0
switch(config)-acl-ip# router pim
switch(config-pim)# accept-rp 30.1.1.1 access-list pim_rp_grp_acl
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

active-active

```
active-active
no active-active
```

Description

Enables the PIM active-active mechanism per VRF on VSX. The default is disabled.

The **no** form of this command disables the PIM active-active mechanism.

Usage

PIM active-active keeps the multicast forwarding state synchronized on both VSX peer devices. Synchronization is achieved by electing the VSX peer that has the highest IP address as a designated router (DR) and the other as Proxy-DR.

If you want the multicast traffic to flow through VSX primary, assign higher IP addresses to the interfaces in VSX primary. When the VSX peer that is acting as the DR goes down, traffic is recovered faster since the multicast routes are synchronized.

Recommendations:

- Do not configure the DR priority of interfaces when **active-active** is enabled. The DR priority will be set to high on DR and default on Proxy-DR and any user-configured DR priority will be ignored.
- Always configure **keepalive** between VSX peers. If the ISL goes down when **keepalive** is not configured, both VSX peers start acting independently as DRs, resulting in duplicate traffic.
- Do not configure IGMP joins on transit VLANS.

- RP redundancy is not supported on the **active-active** mechanism. If one of the VSX peers is configured as RP and it goes down, the new traffic flows will not be converged until the RP is elected. For a static RP, new flows will never be converged until the VSX peer is back up.

Examples

Enabling the PIM active-active mechanism:

```
switch(config)# router pim
switch(config-pim)# active-active
```

Disabling the PIM active-active mechanism:

```
switch(config)# router pim
switch(config-pim)# no active-active
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

anycast-rp source-directly-connected

```
anycast-rp source-directly-connected
[no] anycast-rp source-directly-connected
```

Description

Use this command with an Anycast rendezvous point (RP) solution (for example, with MSDP) when the same multicast source is directly connected to two or more Anycast RP routers.

Usage

When configured this command allows only one RP who is the Designated Router (DR) in the segment to own the generation of the MSDP SA (Source Active) messages. If this command is not enabled, all Anycast RP routers where the source is directly connected would start advertising SA messages and form a loop. For example. when the source is directly connected to an Anycast RP VSX pair via VSX-LAG. Therefore this configuration is recommended when VSX pairs act as Anycast RPs. This command is optional when the source is directly connected to a single Anycast RP router or when the source is at least one hop away from the RP.

Examples

The following examples configure directly connected sources with Anycast RP, then remove the configuration.

```
switch(config)# router pim
switch(config-pim)# anycast-rp source-directly-connected
switch(config-pim)#
switch(config-pim)# no anycast-rp source-directly-connected
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Users having admin privileges.

bfd all-interfaces

```
bfd all-interfaces
no bfd all-interfaces
```

Description

Enables BFD on all PIM interfaces. BFD can be disabled at individual PIM interface using the **ip pim-sparse bfd disable** command.

The **no** form of this command disables BFD for all the interfaces.

Examples

Enabling and disabling BFD on all PIM interfaces:

```
switch(config)# router pim
switch(config-pim)# bfd all-interfaces
switch(config-pim)# no bfd all-interfaces
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

bsr-candidate bsm-interval

```
bsr-candidate bsm-interval <INTERVAL-VALUE>
no bsr-candidate bsm-interval
```

Description

Configures the interval in seconds to send periodic RP-Set messages to all PIM-SM interfaces on a router that operates as the BSR in a domain. This setting must be smaller than the **rp-candidate hold-time** settings (range of 30 to 255; default 150) configured in the RPs operating in the domain.

The **no** form of this command removes the currently configured value and sets it to the default of 60 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the BSR-candidate BSM interval in seconds. Default: 60 seconds. Range: 5-300.

Example

Configuring and removing BSR-candidate BSM-interval:

```
switch(config)# router pim
switch(config-pim)# bsr-candidate bsm-interval 150
switch(config-pim)# no bsr-candidate bsm-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

bsr-candidate hash-mask-length

```
bsr-candidate hash-mask-length <LENGTH-VALUE>
no bsr-candidate hash-mask-length
```

Description

Controls the distribution of multicast groups among the C-RP, in a domain where there is overlapping coverage of the groups among the RPs. This value specifies the length (number of significant bits) when allocating this distribution. A longer hash-mask-length results in fewer multicast groups, for each block of group addresses assigned to the RPs. Multiple blocks of addresses assigned to each C-RP results in wider dispersal of addresses. Includes enhanced load-sharing for the multicast traffic for the different groups that are used in the domain at the same time.

The **no** form of this command removes currently configured value and sets to the default of 30.

Parameter	Description
<LENGTH-VALUE>	Specifies the length (in bits) of the hash mask. Default: 30. Range: 1-32.

Example

Configuring and removing the BSR-candidate hash-mask-length:

```
switch(config)# router pim
switch(config-pim)# bsr-candidate hash-mask-length 4
switch(config-pim)# no bsr-candidate hash-mask-length
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

bsr-candidate priority

```
bsr-candidate priority <PRIORITY-VALUE>
no bsr-candidate priority
```

Description

Configures the priority to apply to the router when a BSR election process occurs in the PIM-SM domain. The candidate with the highest priority becomes the BSR for the domain. If the highest priority is shared by multiple routers, the candidate having the highest IP address becomes the BSR of the domain. Zero (0) is the lowest priority. To make BSR selection easily predictable, use this command to assign a different priority to each candidate BSR in the PIM-SM domain.

The **no** form of this command removes currently configured value and sets to the default of 0.

Parameter	Description
<PRIORITY-VALUE>	Specifies the priority for the Candidate Bootstrap router. Default: 0. Range: 0-255

Example

Configuring and removing the BSR-candidate priority:

```
switch(config)# router pim
switch(config-pim)# bsr-candidate priority 250
switch(config-pim)# no bsr-candidate priority
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

bsr-candidate source-ip-interface

```
bsr-candidate source-ip-interface <INTERFACE-NAME>
no bsr-candidate source-ip-interface <INTERFACE-NAME>
```

Description

Configures the router to advertise itself as a candidate PIM-SM BSR on the interface specified, and enables BSR candidate operation. The result makes the router eligible to be elected as the BSR for the PIM-SM domain in which it operates. One BSR candidate interface is allowed per-router.

The **no** form of this command removes the Candidate BSR configuration.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to use as a source for Candidate-BSR router IP address. Interface can be a VLAN interface (such as vlan15) or routed interfaces (such as lag 1 or 1 / 1 / 19). PIM-SM must be enabled on this interface (use the **ip pim-sparse enable** command).

Example

On the 6400 Switch Series, interface identification differs.

Configuring and removing the BSR-candidate interface:

```
switch(config)# router pim
switch(config-pim)# bsr-candidate source-ip-interface 1/1/4
switch(config-pim)# bsr-candidate source-ip-interface vlan5
switch(config-pim)# no rp-candidate source-ip-interface 1/1/4
```

Configuring and removing sub-interface 1/1/4.10 as the BSR-candidate:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# router pim
switch(config-pim)# bsr-candidate source-ip-interface 1/1/4.10
switch(config-pim)#
switch(config-pim)# no rp-candidate source-ip-interface 1/1/4.10
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables PIM globally on the router. PIM is disabled by default.

Using the **disable** command will cause all the multicast routes to be erased from hardware.

Example

Disabling PIM router:

```
switch(config)# router pim
switch(config-pim)# disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables PIM globally on the router.

Example

Enabling PIM router:

```
switch(config)# router pim
switch(config-pim)# enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

ip mroute

`ip mroute <SRC-ADDR/SRC-MASK> <RPF-ADDRESS> | <INTERFACE-NAME>`

Description

Configures multicast reverse path (RPF) forwarding static routes. This command is an alias of the **rpf-override** command.

Parameter	Description
<SRC-ADDR>	Specifies the multicast source address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<SRC-MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
<RPF-ADDR>	Specifies the RPF address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<INTERFACE-NAME>	Specifies the RPF interface name.

Usage

Reverse Path Forward (RPF) checking is a core multicast routing mechanism. The RPF ensures that the multicast traffic received arrives on the expected router interface before further processing. If the RPF check fails for a multicast packet, the packet is discarded. For multicast traffic flow that arrives on the SPT, the expected incoming interface for a given source or group is the interface towards the source address of the traffic (determined by the unicast routing system). For traffic arriving on the RP tree, the expected incoming interface is the interface towards the RP.

Example

Configuring and removing an IP mroute:

```
switch(config)# router pim
switch(config-pim)# ip mroute 40.0.0.4/24 30.0.0.4
switch(config-pim)# no ip mroute 40.0.0.4/24 30.0.0.4
```

Configuring and removing an IP mroute for an IPv6 address:

```
switch(config-pim)# router pim6
switch(config-pim6)# ipv6 mroute 50::4/24 tunnel1
switch(config-pim6)# no ipv6 mroute 50::4/24 tunnel1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ip multicast boundary

```
ip multicast boundary access-list <acl_name>
no ip multicast boundary access-list <acl_name>
```

Description

This command configures administratively-scoped multicast boundaries on PIM-enabled Interfaces. A multicast boundary uses an Access Control List (ACL) to filter multicast traffic on the specified interface and prevent the routing of multicast traffic from that interface. This feature supports filtering based on IP, IGMP, and PIM protocols, and can filter both multicast data traffic and control packets, including **IGMP Join**, **PIM Join**, and **Prune** messages. The ACL can use the **any** filter to match traffic from any source to a specific IP multicast group (*,G), and can contain subnet masks to match a range of addresses.

Parameter	Description
`access-list` *`<acl_name>`*	Name of the boundary ACL to be applied on the interface.

Usage

When the multicast boundary is configured, MSDP is used to learn the multicast sources across the boundaries. Based on the ACL rules configured, the multicast traffic from one domain to other domain is permitted/denied. MSDP SA messages will always be forwarded across the boundaries regardless of multicast boundary ACL configurations. Anycast RP with MSDP mesh group across the boundaries is not supported. Multicast boundary feature is supported only for IPv4 currently. Multicast boundary feature is not supported on VXLAN based overlay networks.

Examples

The following example creates a boundary that denies multicast group IP addresses in 239.0.0.0/8 and permits group addresses in 224.0.0.0/4. Since the source address is **any**, it matches traffic from any multicast source (*,G).

```
access-list ip boundary1
    10 deny any any 239.0.0.0/255.0.0.0
    20 permit any any 224.0.0.0/240.0.0.0
interface vlan 40
    ip address 40.1.1.1/24
    ip pim-sparse enable
    ip multicast boundary access-list boundary1
```

The following example creates a boundary which permits traffic for specific multicast sources and groups IP addresses, and implicitly denies all other traffic.

```
access-list ip boundary2
    10 permit any 192.168.1.1 225.1.1.0/255.255.255.0
    20 permit any 172.168.1.1 239.1.1.0/255.255.255.0
interface vlan 40
    ip address 40.1.1.1/24
    ip pim-sparse enable
    ip multicast boundary access-list boundary2
```

The following boundary ACL creates a boundary based on protocols. The **PIM**, **IGMP**, **and IP** packets from the specified (S,G) are denied and all other traffic for 239.1.1.0/24 is allowed.

```
access-list ip boundary3
    30 deny pim 192.168.1.1 239.1.1.5
    40 deny igmp 192.168.1.1 239.1.1.5
    41 deny any 192.168.1.1 239.1.1.5
    50 permit any any 239.1.1.0/255.255.255.0
interface vlan 40
    ip address 40.1.1.1/24
    ip pim-sparse enable
    ip multicast boundary access-list boundary3
```

Related Commands

Command	Description
show ip multicast boundary interface	Displays IP Multicast boundary ACL configurations and packet drop counters for the given interface.

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip multicast multipath

```
ip multicast multipath {s-hash|s-g-hash}
no ip multicast multipath {s-hash|g-hash}
```

Description

This command configures the multipath hash mode, which allows the switch to determine the nexthop in the RPF path if there are multiple equal cost paths to a source address. PIM S,G join messages are sent to the selected nexthop which results in a multicast traffic flow in the selected paths. An even distribution of available nexthops across different multicast flows improves the utilization of ECMP paths.

Parameter	Description
`s-hash`	The hash to select the nexthop is based on only the source address. Flows originating from different sources will use different ECMP paths as the source is considered for selecting the nexthop. If the same source sends streams for multiple groups, then all the streams use only one of the ECMP paths. This is the default setting for this feature .
`s-g-hash`	This method uses both source and group address to select the nexthop. This allows better distribution of flows in scenarios where single source is streaming traffic for multiple groups.

Usage

Use this command only for route lookups for a source address and not for an Rendezvous Point (RP) address. The PIM *,G join messages which enable route lookup for the RP always uses the default **s-hash** mode, where nexthop is selected based on the RP IP address alone, and the group address is not part of the hash computation. Changes to the multipath has mode can result in traffic loss as the existing route cache is cleared and new route lookups are initiated. In topologies where PIM Assert messages are triggered, RPF lookups are not honored, and the packet forwarding path will be decided based on the assert winner.

Examples

Configuring the hash mode for an individual VRF:

```
switch(config)# vrf example
switch(config-vrf)# ip multicast multipath s-hash
```

Configuring the hash mode globally:

```
switch(config)# ip multicast multipath s-g-hash
```

Related Commands

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-vrf`	Administrators or local user group members with execution rights for this command.

ip pim-sparse

```
ip pim-sparse {enable|disable}
no ip pim-sparse [enable]
```

Description

Enables or disables PIM-SM in the current interface. PIM-SM is disabled by default on an interface. IP address must be configured on the interface to enable PIM-SM.

Parameter	Description
`enable`	Specifies PIM SM on the interface. IP address must be configured on the interface to enable PIM-SM.
`disable`	Disables PIM SM on the interface.

Examples

Enabling and disabling PIM-SM:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip address 40.0.0.4/24
switch(config-if-vlan)# ip pim-sparse enable
switch(config-if-vlan)# ip pim-sparse disable
```

Configuring and disabling PIM-SM on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# ip add 100.100.1.1/24
switch(config-subif)# ip pim-sparse enable
switch(config-subif)# switch(config-subif)# ip pim-sparse disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-sparse bfd

```
ip pim-sparse bfd [disable]
no ip pim-sparse bfd
```

Description

Configures BFD on a per-interface basis for one interface associated with the PIM process.

The **no** form of this command removes the BFD configuration on the interface and sets it to the default configuration.

If BFD is enabled globally, it will be enabled by default on all interfaces. The only exception is when it is disabled specifically on an interface using the **ip pim-sparse bfd disable** command.
If BFD is disabled globally, it will be disabled by default on all interfaces. The only exception is when it is enabled specifically on an interface using the **ip pim-sparse bfd** command.

Parameter	Description
`disable`	Disables the BFD configuration on the interface.

Examples

Enabling the BFD configuration on the interface:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip pim-sparse bfd
```

Removing the BFD configuration on the interface:

```
switch(config-if-vlan)# no ip pim-sparse bfd
```

Disabling the BFD configuration on the interface and overriding the global setting:

```
switch(config-if-vlan)# ip pim-sparse bfd disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-if-vlan`	Administrators or local user group members with execution rights for this command.

ip pim-sparse bsr-boundary

```
ip pim-sparse bsr-boundary
no ip pim-sparse bsr-boundary
```

Description

Prevent exchange of PIM Bootstrap messages across multicast boundaries.

Usage

Best practices is to avoid exchanging PIM Bootstrap messages across different multicast domains as it will lead to election of RP in a different domain. When this command is configured on a boundary interface, PIM BSMs originating from other domain will be dropped and PIM BSMs originated within this domain will not forwarded to other domain. Note that this command will filter only PIM BSMs and is recommended to be enabled along with ip multicast boundary.

Examples

Configuring and removing the BSR boundary:

```
switch(config-if)# interface 1/1/1
switch(config-if)# ip pim-sparse bsr-boundary
switch(config-if)# no ip pim-sparse bsr-boundary
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Users having admin privileges.

ip pim-sparse dr-priority

```
ip pim-sparse dr-priority <PRIORITY-VALUE>
no ip pim-sparse dr-priority
```

Description

Changes the router priority for the designated router (DR) election process in the current interface.

A numerically higher value means a higher priority. If multiple routes share the highest priority, the router with the highest IP address is selected as the DR.

The **no** form of this command removes currently configured value and sets to the default of 1.

Parameter	Description
<PRIORITY-VALUE>	Specifies the priority value to use on the interface in the DR election process. Required. Default: 1. Range: 0- to 0-4294967295.

Examples

Configuring and removing the interface priority value:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip pim-sparse dr-priority 4444
switch(config-if-vlan)# no ip pim-sparse dr-priority
```

Configuring and removing the interface priority value in the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# ip pim-sparse dr-priority 1000
switch(config-subif)#
switch(config-subif)# no ip pim-sparse dr-priority
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-sparse hello-delay

```
ip pim-sparse hello-delay <DELAY-VALUE>
no ip pim-sparse hello-delay
```

Description

Configures the maximum time in seconds before the router actually transmits the initial PIM hello message on the current interface.

The **no** form of this command removes currently configured value and sets to the default of 5 seconds.

Parameter	Description
<DELAY-VALUE>	Specifies the hello-delay in seconds, which is the maximum time before a triggered PIM Hello message is transmitted on this interface. Default: 5. Range: 0 to 5.

Usage

- In cases where a new interface activates connections with multiple routers. If all the connected routers sent hello packets at the same time, the receiving router could become momentarily overloaded.
- This command randomizes the transmission delay to a time between zero and the hello delay setting. Using zero means no delay. After the router sends the initial hello packet to a newly detected interface, it sends subsequent hello packets according to the current hello interval setting.

Example

Configuring and removing hello-delay interface:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip pim-sparse hello-delay 4
switch(config-if-vlan)# no ip pim-sparse hello-delay
```

Configuring and removing hello-delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# ip pim-sparse hello-delay 4
switch(config-subif)#
switch(config-subif)# no ip pim-sparse hello-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-sparse hello-interval

```
ip pim-sparse hello-interval <INTERVAL-VALUE>
no ip pim-sparse hello-interval
```

Description

Configures the frequency at which the router transmits PIM hello messages on the current interface.

The **no** form of this command removes the currently configured value and sets to the default of 30 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the frequency at which PIM Hello messages are transmitted on this interface. Range: 5 to 300. Default: 30.

Usage

- The router uses hello packets to inform neighbor routers of its presence.
- The router also uses this setting to compute the hello holdtime, which is included in hello packets sent to neighbor routers.

- Hello holdtime tells neighbor routers how long to wait for the next hello packet from the router. If another packet does not arrive within that time, the router removes the neighbor adjacency on that interface from the PIM adjacency table, which removes any flows running on that interface.
- Shortening the hello interval reduces the hello holdtime. If they do not receive a new hello packet when expected, it changes how quickly other routers stop sending traffic to the router.

Example

Configuring and removing sparse hello-interval:

```
switch(config)# interface vlan 20
switch(config-if-vlan)# ip pim-sparse hello-interval 60
switch(config-if-vlan)# no ip pim-sparse hello-interval
```

Configuring and removing sparse hello-interval on the sub-interface:

Applies only to the Aruba 6300, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# ip pim-sparse hello-interval 60
switch(config-subif)#
switch(config-subif)# no ip pim-sparse hello-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if config-if-vlan config-lag-if config-subif	Administrators or local user group members with execution rights for this command.

ip pim-sparse ip-addr

```
ip pim-sparse ip-addr {<IP-ADDR-VALUE> | any}
no ip pim-sparse ip-addr
```

Description

Enables the router to dynamically determine the source IP address to use for PIM-SM packets sent from the interface or to use the specific IP address.

The **no** form of this command removes the currently configured value and sets to the default of **any**.

Parameter	Description
<IP-ADDR-VALUE>	Specifies an IP address as the source IP for the interface.
`any`	Specifies dynamically determining the source IP from the current IP address of the interface.

Examples

Configuring and removing source IP address:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip pim-sparse ip-addr 40.0.0.4
switch(config-if-vlan)# no ip pim-sparse ip-addr
```

Configuring and removing source IP address on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# ip pim-sparse ip-addr 10.0.0.1
switch(config-subif)#
switch(config-subif)# no ip pim-sparse ip-addr
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-sparse lan-prune-delay

```
ip pim-sparse lan-prune-delay
```

```
no ip pim-sparse lan-prune-delay
```

Description

Enables the LAN prune delay option on the current interface. The default is enabled.

With LAN-prune-delay enabled, the router informs downstream neighbors how long it will wait before pruning a flow after receiving a prune request. Other downstream routers on the same interface must send a join to override the prune before the LAN-prune-delay time to continue the flow. Prompts any downstream neighbors with multicast receivers continuing to belong to the flow to reply with a join. If no joins are received after the LAN-prune-delay period, the router prunes the flow. The propagation-delay and override-interval settings determine the LAN-prune-delay setting.

The **no** form of this command disables the LAN prune delay option.

Example

Enabling and disabling the LAN prune delay:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip pim-sparse lan-prune-delay
switch(config-if-vlan)# no ip pim-sparse lan-prune-delay
```

Enabling and disabling the LAN prune delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# no ip pim-sparse lan-prune-delay
switch(config-subif)#
switch(config-subif)# ip pim-sparse lan-prune-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-sparse override-interval

```
ip pim-sparse override-interval <INTERVAL-VALUE>
no ip pim-sparse override-interval
```

Description

Configures the override interval that gets inserted into the Override Interval field of a LAN Prune Delay option.

The **no** form of this command removes the currently configured value and sets the value to the default of 2500 ms.

Parameter	Description
<INTERVAL-VALUE>	Specifies the override interval of a LAN Prune Delay option in ms. Range: 500 to 6000. Default: 2500.

Usage

A router sharing a VLAN with other multicast routers uses the override-interval value along with the propagation-delay value to compute the **lan-prune-delay** setting. The setting specifies how long to wait for a PIM-SM join after receiving a prune packet from downstream for a particular multicast group.

Example scenario:

A network may have multiple routers sharing VLAN X. When an upstream router is forwarding traffic from multicast group X to VLAN Y, if one of the routers on VLAN Y does not want this traffic, it issues a prune response to the upstream neighbor. The upstream neighbor then goes into a prune pending state for group X on VLAN Y. During this period, the upstream neighbor continues to forward the traffic. During the pending period, another router on VLAN Y can send a group X join to the upstream neighbor. If this happens, the upstream neighbor drops the prune pending status and continues forwarding the traffic. But if no routers on the VLAN send a join, the upstream router prunes.

Example

Configuring and removing the override interval:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip pim-sparse override-interval 4000
switch(config-if-vlan)# no ip pim-sparse override-interval
```

Configuring and removing the override interval on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# ip pim-sparse override-interval 4000
switch(config-subif)#
switch(config-subif)# no ip pim-sparse override-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ip pim-sparse propagation-delay

```
ip pim-sparse propagation-delay <DELAY-VALUE>
no ip pim-sparse propagation-delay
```

Description

Configures the propagation delay that gets inserted into the LAN prune delay field of a LAN Prune Delay option.

The **no** form of this command removes currently configured value and sets to the default of 500 ms.

Parameter	Description
<DELAY-VALUE>	Specifies the propagation delay value in ms. Range: 250 to 2000. Default: 500.

Examples

Configuring and removing the propagation delay:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ip pim-sparse propagation-delay 400
switch(config-if-vlan)# no ip pim-sparse propagation-delay
```

Configuring and removing the propagation delay on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config-if)# interface 1/1/10.10
switch(config-subif)# ip pim-sparse propagation-delay 400
switch(config-subif)#
switch(config-subif)# no ip pim-sparse propagation-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

join-prune-interval

```
join-prune-interval <INTERVAL-VALUE>
no join-prune-interval
```

Description

Configures the frequency at which the router will send periodic join or prune-interval messages.

The **no** form of this command sets the interval to the default value of 60 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the join-prune-interval in seconds. Range 5 to 65535 Default: 60.

Examples

Configuring join prune interval:

```
switch(config)# router pim
switch(config-pim)# join-prune-interval 400
switch(config-pim)# no join-prune-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

multicast-route-limit

```
multicast-route-limit <limit>
no multicast-route-limit <limit>
```

Description

Configures the limit on the maximum number of multicast route entries that can be programmed. When the limit is configured, multicast route entries created because of IGMP or MLD membership reports, and multicast route entries created because of multicast streams are restricted to the configured limit.

The **no** form of this command removes the currently configured limit value.

Parameter	Description
<limit>	Specifies the value to be configured as the multicast route limit. Range: 1 to 4294967295.

Usage

Flows exceeding the configured multicast route limit will be programmed as a bridge entry and will not have the outgoing interfaces list populated. This configuration prevents creation of new multicast routes when limits are reached. At the time of configuration, if the device has more multicast routes than the configured limit, existing multicast routes continue to exist until they are removed.

The flows are programmed in the HW on a FCFS basis. There could be scenarios where the flow is forwarded in neighbor router, but it may not be forwarded on the current router because of exceeding the limits configured on the current router. In such cases, it is recommended to configure higher limits to avoid traffic outage.

Examples

Configuring and removing the multicast route rate limit:

```
switch(config)# router pim
switch(config-pim)# multicast-route-limit 1024
switch(config-pim)# no multicast-route-limit
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

no ip pim-sparse

```
no ip pim-sparse
```

Description

Removes all the PIM-SM related configurations for the interface.

Example

Removing PIM-SM configuration:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# no ip pim-sparse
```

Removing PIM-SM configuration on the sub-interface:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# interface 1/1/10.10
switch(config-subif)# no ip pim-sparse
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

register-rate-limit

```
register-rate-limit <limit>
no register-rate-limit <limit>
```

Description

Configures the limit on the maximum number of register messages sent per second for every unique (S,G) entry. By default, there is no maximum rate set. When the limit is configured, register messages generation is limited to the configured value.

The **no** form of this command removes the currently configured limit value.

Parameter	Description
<limit>	Specifies the value to be configured as the register rate limit. Range: 1 to 4294967295.

Examples

Configuring and removing the register rate limit:

```
switch(config)# router pim
switch(config-pim)# register-rate-limit 10
switch(config-pim)# no register-rate-limit
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

register-source

```
register-source <INTERFACE-NAME>
no register-source <INTERFACE-NAME>
```

Description

Specifies the source interface to be used for PIM registration in the case of VXLAN anycast interfaces. When the PIM enabled anycast VLAN is directly connected to a multicast source, **register-source** is used to send registration messages to the RP and this interface receives the register-stop messages from the RP.

The **no** form of this command removes the register source configuration.

Parameter	Description
<INTERFACE-NAME>	Specifies the name of the interface to use.

Usage

- This is a global configuration under router-pim configuration and is required in Symmetric IRB with anycast IP address configuration.
- This configuration is required in the source connected switch only when the PIM-DR and RP are in two different switches.
- Without this configuration, there will be traffic loss as the registration sequence will not be successful. It is mandatory to have this source interface configured with a non-anycast IP address which is unique to the VTEP, and with PIM enabled.

Examples

Configuring the source interface for PIM registrations:

```
switch# config
switch(config)# router pim vrf vrf1
switch(config-pim)# register-source loopback1
```

Removing the **register-source** configuration:

```
switch(config-pim)# no register-source loopback1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09.1000	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

router pim

```
router pim [vrf <VRF-NAME>]
   accept-register access-list <ACL-RULE>
   accept-rp <IP-ADDR> access-list <ACL-RULE>
   active-active
   bfd all-interfaces
   bsr-candidate {bsm-interval <INTERVAL-VALUE> | {hash-mask-length <LENGTH-VALUE> |
   priority <PRIORITY-VALUE> | source-ip-interface <INTERFACE-NAME>}
   enable|disable
   join-prune-interval <INTERVAL-VALUE>
   multicast-route-limit <limit>
   no ...
   register-rate-limit <limit>
```

```
rp-address <IP-ADDR> [<GRP-ADDR/GRP-MASK>] [override]
rp-candidate {group-prefix <GRP-ADDR/GRP-MASK>  |hold-time <TIME-VALUE> | priority
<PRIORITY-VALUE> | source-ip-interface <INTERFACE-NAME> [group-prefix <GRP-ADDR/GRP-
MASK>]}
rpf-override <SRC-ADDR/SRC-MASK><RPF-ADDR|INTERFACE-NAME>
```

Description

Changes the current context to the PIM configuration context and enables PIM globally on the router. If no VRF is specified, the default VRF is assumed.

The **no** form of this command removes the PIM configuration from the specified context or the default VRF.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the name of a VRF.
`accept-register access-list <ACL-RULE>`	Specify an ACL rule name to configures ACL on RP to filter PIM Register packets from unauthorized sources. The ACL specified will contain the (S,G) traffic in register packets to permitted or denied.
`accept-rp <IP-ADDR> access-list <ACL-RULE>`	Specify the IPv4 address of the static RP and ACL rule name to enable the PIM router to filter PIM join/prune messages destined for a specific RP and specific groups. The ACL specifies the group addresses which are allowed or denied. Up to 8 RP addresses and group ACL can be associated with the PIM router. PIM will store the accepted RP address and the associated group ACL. When a join or prune message is received, a RP look up is made for the packet. If the RP is in the configured list and if the group in the join/prune packet is allowed in the ACL, the packet is allowed. Otherwise the packet is dropped. To allow join/prune message from any groups, group address in the ACL can be wild-carded. In this case, only RP address check is performed. This parameter impacts only (*,G) join/prune messages. If there are any existing flows, the user will need to disable and enable PIM on the interface to apply the ACL. Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements. When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received. **NOTE:** If there is an active flow which is in the SPT, the traffic flow through the SPT will continue. Only (*,G) join/prune messages are dropped. (S,G) join/prune messages will not be impacted.
`active-active`	Enables the PIM active-active mechanism per VRF on VSX. The default is disabled. PIM active-active keeps the multicast forwarding state synchronized on both VSX peer devices.

Parameter	Description
	Synchronization is achieved by electing the VSX peer that has the highest IP address as a designated router (DR) and the other as Proxy-DR. If you want the multicast traffic to flow through VSX primary, assign higher IP addresses to the interfaces in VSX primary. When the VSX peer that is acting as the DR goes down, traffic is recovered faster since the multicast routes are synchronized.
`bfd all-interfaces`	Enables BFD on all PIM interfaces. BFD can be disabled at individual PIM interface using the **ip pim-sparse bfd disable** command.
`bsr-candidate`	Configure settings for a router that operates as the BSR in a domain.
`bsm-interval` *`<INTERVAL-VALUE>`*	Configures the interval in seconds to send periodic RP-Set messages to all PIM-SM interfaces on a router that operates as the BSR in a domain. This setting must be smaller than the **rp-candidate hold-time** settings (range of 30 to 255; default 150) configured in the RPs operating in the domain. Default: 60 seconds. Range: 5-300.
`hash-mask-length` *`<LENGTH-VALUE>`*	Controls the distribution of multicast groups among the C-RP, in a domain where there is overlapping coverage of the groups among the RPs. This value specifies the length (number of significant bits) when allocating this distribution. A longer hash-mask-length results in fewer multicast groups, for each block of group addresses assigned to the RPs. Multiple blocks of addresses assigned to each C-RP results in wider dispersal of addresses. Includes enhanced load-sharing for the multicast traffic for the different groups that are used in the domain at the same time. Default: 30 bits. Range: 1-32.
`priority <PRIORITY-VALUE>`	Configures the priority to apply to the router when a BSR election process occurs in the PIM-SM domain. The candidate with the highest priority becomes the BSR for the domain. If the highest priority is shared by multiple routers, the candidate having the highest IP address becomes the BSR of the domain. Zero (0) is the lowest priority. To make BSR selection easily predictable, use this command to assign a different priority to each candidate BSR in the PIM-SM domain. Default: 0. Range: 0-255
`source-ip-interface` *`<INTERFACE-NAME>`*	Configures the router to advertise itself as a candidate PIM-SM BSR on the interface specified, and enables BSR candidate operation. The result makes the router eligible to be elected as the BSR for the PIM-SM domain in which it operates. One BSR candidate interface is allowed per-router. The Interface can be a VLAN interface (such as vlan15) or routed interfaces (such as lag 1 or 1 / 1 / 19). PIM-

Parameter	Description
	SM must be enabled on this interface (use the **ip pim-sparse enable** command).
`enable|disable`	Enables or disables PIM globally on the router.
`join-prune-interval <INTERVAL-VALUE>`	Configures the frequency at which the router will send periodic join or prune-interval messages. Range 5 to 65535 Default: 60.
`multicast-route-limit <limit>`	Configures the limit on the maximum number of multicast route entries that can be programmed. When the limit is configured, multicast route entries created because of IGMP or MLD membership reports, and multicast route entries created because of multicast streams are restricted to the configured limit. Flows exceeding the configured multicast route limit will be programmed as a bridge entry and will not have the outgoing interfaces list populated. This configuration prevents creation of new multicast routes when limits are reached. At the time of configuration, if the device has more multicast routes than the configured limit, existing multicast routes continue to exist until they are removed. The flows are programmed in the HW on a FCFS basis. There could be scenarios where the flow is forwarded in neighbor router, but it may not be forwarded on the current router because of exceeding the limits configured on the current router. In such cases, it is recommended to configure higher limits to avoid traffic outage. Range: 1 to 4294967295.
`no...`	Negates any configured parameter.
`register-rate-limit <limit>`	Configures the limit on the maximum number of register messages sent per second for every unique (S,G) entry. By default, there is no maximum rate set. When the limit is configured, register messages generation is limited to the configured value. Range: 1 to 4294967295.
`rp-address`	Statically configures the router as the RP for a specified multicast group or range of multicast groups. When a static RP and a C-RP are configured to support the same multicast groups and the multicast group mask for the static RP is equal to or greater than the same mask for the applicable C-RPs, this command assigns the higher precedence to the static RP, resulting in the C-RP operating only as a backup RP for the configured group. Without override, the C-RP has precedence over a static RP configured for the same multicast group or groups. This must be configured on all PIM-SM routers in the domain. If group address is not specified, it applies to all IPv4 multicast addresses (224.0.0.0 - 239.255.255.255). PIM-SM supports a maximum of 8 static RPs per VRF.

Parameter	Description
<IP-ADDR>	Specifies the address of the static RP in IPv4 format (**x.x.x.x**).
<GRP-ADDR/GRP-MASK>	Specifies the multicast group address in IPv4 format (**x.x.x.x**) and the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`override`	Specifies higher precedence to static RP over Candidate RP.
`rp-candidate`	Configure Candidate Rendezvous Point (C-RP) settings.
`group-prefix` *<GRP-ADDR/GRP-MASK>*	Adds multicast group address to the current Candidate Rendezvous Point (C-RP) configuration by specifying the the multicast group address in IPv4 format (**x.x.x.x**) and the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`hold-time` *<TIME-VALUE>*	Changes the hold-time a C-RP includes in its advertisements to the BSR. Hold-time is included in the advertisements the C-RP periodically sends to the elected BSR for the domain. Also updates the BSR on how long to wait after the last advertisement from the reporting RP before assuming it has become unavailable. Range: 30 to 250. Default: 150.
`priority` *<PRIORITY-VALUE>*	Changes the current priority setting for a C-RP. Where multiple C-RP configurations are used to support the same multicast groups, the candidate having the highest priority is elected. Zero (0) is the highest priority, and 255 is the lowest priority. Range: 0 to 255. Default: 192.
source-ip-interface	Enables the Candidate Rendezvous Point (C-RP) operation, and configures the router to advertise itself as a C-RP to the Bootstrap Router (BSR) for the current domain. This step includes the option to allow the C-RP to be a candidate for all possible multicast groups, or for up to four multicast groups, or ranges of groups. If group-prefix is not given, it considers for all multicast group addresses.
<INTERFACE-NAME>	Specifies the interface to use as a source for the C-RP router IP address.
`group-prefix` *<GRP-ADDR/GRP-MASK>*	Specifies the multicast group address in IPv4 format (**x.x.x.x**) and the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`rpf-override`	The Reverse Path Forward (RPF) override allows overriding the normal RPF lookup mechanism, and indicates to the router that it may accept multicast traffic on an interface other than the one that the RPF lookup mechanism would normally select. This

Parameter	Description
	includes accepting traffic from an invalid source IP address for the subnet or VLAN that is directly connected to the router. Traffic may also be accepted from a valid PIM neighbor that is not on the reverse path towards the source of the received multicast traffic.
`<SRC-ADDR/SRC-MASK>`	Specifies the multicast source IPv4 address in IPv4 format (**x.x.x.x**) and the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`<RPF-ADDR|INTERFACE-NAME>`	Specifies the RPF override IP address or interface.

Usage

When a register ACL is associated with a PIM Router, the PIM protocol will store the source and destination address details along with the action (permit or deny). If there are any existing flows, the user will need to disable and enable PIM on the interface to apply the ACL.

Upon receiving the register messages, a look up is made to check if the S and G in the packet is in the permitted list. If there is no match or if there is a deny rule match, a register stop message is immediately sent and the packet is dropped and no further action is taken. Permitted packets will go through the normal flow.

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

Recommendations for the active-active mechanism:

- Do not configure the DR priority of interfaces when **active-active** is enabled. The DR priority will be set to high on DR and default on Proxy-DR and any user-configured DR priority will be ignored.
- Always configure **keepalive** between VSX peers. If the ISL goes down when **keepalive** is not configured, both VSX peers start acting independently as DRs, resulting in duplicate traffic.
- Do not configure IGMP joins on transit VLANS.
- RP redundancy is not supported on the **active-active** mechanism. If one of the VSX peers is configured as RP and it goes down, the new traffic flows will not be converged until the RP is elected. For a static RP, new flows will never be converged until the VSX peer is back up.

Reverse Path Forward (RPF) override usage details:

- Reverse Path Forward (RPF) checking is a core multicast routing mechanism. The RPF ensures that the multicast traffic received arrives on the expected router interface before further processing. If the RPF check fails for a multicast packet, the packet is discarded. For multicast traffic flow that arrives on the SPT, the expected incoming interface for a given source or group is the interface towards the source address of the traffic (determined by the unicast routing system). For traffic arriving on the RP tree, the expected incoming interface is the interface towards the RP.
- RPF checking is applied to all multicast traffic and is significant in preventing network loops. Up to eight manual RPF overrides can be specified. The RPF-address indicates one of two distinct RPF candidates:

1. A valid PIM neighbor address from which forwarded multicast traffic is accepted with a source address of ***<source-addr/src-mask>***.
2. A local router address on a PIM-enabled interface to which ***<source-addr/src-mask>*** is directly connected. If configured, the local router will assume the role of DR for this flow and registers the flow with an RP.

Examples

Configuring and enabling default router PIM:

```
switch(config)# router pim
switch(config-pim)#enable
```

Configuring specified router PIM:

```
switch(config)# router pim vrf green
switch(config-pim)#
```

Configuring ACL on RP with an ACL rule named **pim_reg_acl**:

```
switch(config)# access-list ip pim_reg_acl
switch(config-acl-ip)# 10 permit any 20.1.1.1 225.1.1.2
switch(config-acl-ip)# 20 deny any 30.1.1.1 225.1.1.3
switch(config)# router pim
switch(config-pim)# accept-register acces
```

Configuring ACL on a RP with an ACL rule named **pim_rp_grp_acl** to filter join/prune messages:

```
switch(config)# access-list ip pim_rp_grp_acl
switch(config-acl-ip)# 10 permit any any 225.1.1.2/255.255.255.0
switch(config-acl-ip)# 20 permit any any 239.1.1.2/255.255.255.0
switch(config)-acl-ip# router pim
switch(config-pim)# accept-rp 30.1
```

On the 6400 Switch Series, interface identification differs.

Configuring and removing the BSR-candidate interface:

```
switch(config)# router pim
switch(config-pim)# bsr-candidate source-ip-interface 1/1/4
switch(config-pim)# bsr-candidate source-ip-interface vlan5
switch(config-pim)# no rp-candidate source-ip-interface 1/1/4
```

Configuring and removing sub-interface 1/1/4.10 as the BSR-candidate:

Applies only to the Aruba 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series.

```
switch(config)# router pim
switch(config-pim)# bsr-candidate source-ip-interface 1/1/4.10
switch(config-pim)#
switch(config-pim)# no rp-candidate source-ip-interface 1/1/4.10
```

Configuring and removing the multicast route rate limit:

```
switch(config)# router pim
switch(config-pim)# multicast-route-limit 1024
switch(config-pim)# no multicast-route-limit
```

Configuring and removing the register rate limit:

```
switch(config)# router pim
switch(config-pim)# register-rate-limit 10
switch(config-pim)# no register-rate-limit
```

Configuring and removing candidate-RP router priority and hold times

```
switch(config)# router pim
switch(config-pim)# rp-candidate priority 250
switch(config-pim)# rp-candidate hold-time 200
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.11	Sub-interface support extended to 8325 and 10000 Switch Series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

rp-address

```
rp-address <IP-ADDR> [<GRP-ADDR/GRP-MASK>] [override]
no rp-address <IP-ADDR> [<GRP-ADDR/GRP-MASK>] [override]
```

Description

Statically configures the router as the RP for a specified multicast group or range of multicast groups. This must be configured on all PIM-SM routers in the domain. If group address is not specified, it applies to all IPv4 multicast addresses (224.0.0.0 - 239.255.255.255). PIM-SM supports a maximum of 8 static RPs per VRF. Optionally associates the specified access control list to the given static RP address.

The **no** form of this command removes static RP configuration and its precedence.

Parameter	Description
<IP-ADDR>	Specifies the address of the static RP in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<GRP-ADDR>	Specifies the multicast group address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<GRP-MASK>	Specifies the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
override	Specifies higher precedence to static RP over candidate RP.

Usage

Where a static RP and a C-RP are configured to support the same multicast groups and the multicast group mask for the static RP is equal to or greater than the same mask for the applicable C-RPs, this command assigns the higher precedence to the static RP, resulting in the C-RP operating only as a backup RP for the configured group. Without override, the C-RP has precedence over a static RP configured for the same multicast group or groups.

Examples

Configuring the static RP precedence over the candidate RP:

```
switch(config)# router pim
switch(config-pim)# rp-address 40.0.0.4 230.0.0.4/24 ovverride
switch(config-pim)# rp-address 40.0.0.8 222.0.0.4/24
switch(config-pim)# no rp-address 40.0.0.4 230.0.0.4/24
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-pim	Administrators or local user group members with execution rights for this command.

rp-address access list

```
rp-address <IP-ADDR> [access-list <ACL-NAME>][override]
no rp-address <IP-ADDR> [access-list <ACL-NAME>][override]
```

Description

Statically configures the router as the RP and associates the static RP to the specified ACL.

The **no** form of this command removes static RP ACL configuration.

Parameter	Description
<IP-ADDR>	Specifies the address of the static RP in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
access-list <ACL-NAME>	Specifies the name of the access control list.
override	Specifies whether or not static RP configuration precedes the information learned by a BSR.

Usage

The ACL includes a list of permitted/ denied group addresses for the specified RP.

- When configured on a source DR, only permitted group addresses are registered to the RP. When applied on other routers, (*,G) PIM join/prune messages are filtered according to the applied ACL.
- Only destination group addresses in the ACEs are filtered and any other fields configured in the ACE are ignored. If only PIM (*,G) messages need to be filtered, configure **accept-rp** ACLs.
- When static RP ACL is configured, only one static RP can be configured per VRF and that configured RP handles all the multicast groups in range 224.0.0.0/4.

A change in the RP ACL does not impact the flows that have already switched to SPT. Only when the source information is expired and the RP is needed to establish the multicast tree, is the change in the ACL reflected. If the source is always active, PIM can be disabled and re-enabled to clear the learned sources information and re-establish multicast trees based on the latest RP ACL configurations.

Examples

Configuring the static RP ACL:

```
...
access-list ip static_rp_acl
    10 permit any any 225.1.1.1
    20 permit any any 239.1.1.0/255.255.255.0
    30 deny any any 226.1.1.0/255.255.255.0

switch(config)# router pim
switch(config-pim)# rp-address 40.0.0.4 access-list static_rp_acl
```

Removing the static RP ACL configuration:

```
switch(config-pim)# no rp-address 40.0.0.4 access-list static_rp_acl
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Added optional access list parameter **[access-list <ACL-NAME>]**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rp-candidate group-prefix

```
rp-candidate group-prefix <GRP-ADDR/GRP-MASK>
no rp-candidate group-prefix <GRP-ADDR/GRP-MASK>
```

Description

Adds multicast group address to the current Candidate Rendezvous Point (C-RP) configuration.

The **no** form of this command removes C-RP multicast group address.

Parameter	Description
<GRP-ADDR>	Specifies the multicast group address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<GRP-MASK>	Specifies the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.

Examples

Configuring and removing candidate group prefix:

```
switch(config)# router pim
switch(config-pim)# rp-candidate group-prefix 230.0.0.4/24
switch(config-pim)# no rp-candidate group-prefix 230.0.0.4/24
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rp-candidate hold-time

```
rp-candidate hold-time <TIME-VALUE>
no rp-candidate hold-time
```

Description

Changes the hold-time a C-RP includes in its advertisements to the BSR.

Hold-time is included in the advertisements the C-RP periodically sends to the elected BSR for the domain. Also updates the BSR on how long to wait after the last advertisement from the reporting RP before assuming it has become unavailable.

The **no** form of this command removes the currently configured value and sets it to the default value 150 seconds.

Parameter	Description
<TIME-VALUE>	Specifies the hold-time value in seconds to be sent in C-RP-Adv messages. Range: 30 to 250. Default: 150.

Example

Setting and removing the candidate holdtime:

```
switch(config)# router pim
switch(config-pim)# rp-candidate hold-time 250
switch(config-pim)# no rp-candidate hold-time
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rp-candidate priority

```
rp-candidate priority <PRIORITY-VALUE>
```

```
no rp-candidate priority
```

Description

Changes the current priority setting for a C-RP. Where multiple C-RP configurations are used to support the same multicast groups, the candidate having the highest priority is elected. Zero (0) is the highest priority, and 255 is the lowest priority.

The **no** form of this command removes the currently configured value and sets it to the default of 192.

Parameter	Description
<PRIORITY-VALUE>	Specifies the priority value for the Candidate-RP router. Range: 0 to 255. Default: 192.

Example

Configuring and removing candidate priority:

```
switch(config)# router pim
switch(config-pim)# rp-candidate priority 250
switch(config-pim)# no rp-candidate priority
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rp-candidate source-ip-interface

```
rp-candidate source-ip-interface <INTERFACE-NAME> [group-prefix <GRP-ADDR/GRP-MASK>]
no rp-candidate source-ip-interface <INTERFACE-NAME> [group-prefix <GRP-ADDR/GRP-MASK>]
```

Description

Enables the Candidate Rendezvous Point (C-RP) operation, and configures the router to advertise itself as a C-RP to the Bootstrap Router (BSR) for the current domain.

This step includes the option to allow the C-RP to be a candidate for all possible multicast groups, or for up to four multicast groups, or ranges of groups. If group-prefix is not given, it considers for all multicast group addresses.

The **no** form of this command removes the C-RP configuration.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to use as a source for the C-RP router IP address.
<GRP-ADDR>	Specifies the multicast group address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<GRP-MASK>	Specifies the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.

Examples

Configuring and removing candidate source IP interface:

```
switch(config)# router pim
switch(config-pim)# rp-candidate source-ip-interface vlan40 group-prefix
230.0.0.4/24
switch(config-pim)# no rp-candidate source-ip-interface vlan20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rpf-override

```
rpf-override <SRC-ADDR/SRC-MASK> <RPF-ADDR|INTERFACE-NAME>
no rpf-override <SRC-ADDR/SRC-MASK> <RPF-ADDR|INTERFACE-NAME>
```

Description

The Reverse Path Forward (RPF) override, allows overriding the normal RPF lookup mechanism, and indicates to the router that it may accept multicast traffic on an interface other than the one that the RPF lookup mechanism would normally select. This includes accepting traffic from an invalid source IP address for the subnet or VLAN that is directly connected to the router. Traffic may also be accepted from a valid PIM neighbor that is not on the reverse path towards the source of the received multicast traffic.

The **no** form of this command removes currently configured RPF entry.

Parameter	Description
<SRC-ADDR/SRC-MASK>	Specifies the multicast source IPv4 address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. And the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
<RPF-ADDR>	Specifies the RPF address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<INTERFACE-NAME>	Specifies the RPF interface name.

Usage

Reverse Path Forward (RPF) checking is a core multicast routing mechanism. The RPF ensures that the multicast traffic received arrives on the expected router interface before further processing. If the RPF check fails for a multicast packet, the packet is discarded. For multicast traffic flow that arrives on the SPT, the expected incoming interface for a given source or group is the interface towards the source address of the traffic (determined by the unicast routing system). For traffic arriving on the RP tree, the expected incoming interface is the interface towards the RP.

Example

Configuring and removing RPF override:

```
switch(config)# router pim
switch(config-pim)# rpf-override 40.0.0.4/24 30.0.0.4
switch(config-pim)# no rpf-override 40.0.0.4/24 30.0.0.4
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

show ip mroute

```
show ip mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows mroute information for all VRFs.
`vrf` *`<VRF-NAME>`*	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing IP mroute for the default VRF:

```
Switch(config-vlan-20)# show ip mroute
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : 232.10.10.10
Source Address           : 192.168.20.2
SSM Mroute               : True
Neighbor                 : 192.168.3.0
Uptime                   : 02:08:31
State                    : route
Incoming interface       : 1/1/5
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding
```

Showing IP mroute for all VRFs:

```
switch# do show ip mroute all-vrfs
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : 232.10.10.10
Source Address           : 192.168.2.100
SSM Mroute               : True
Neighbor                 : 192.168.3.0
Uptime                   : 00:38:24
State                    : route
Incoming interface       : 1/1/4
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding

VRF : red
Total number of entries : 1

Group Address            : 232.11.11.11
Source Address           : 30.0.0.3
SSM Mroute               : True
```

```
Neighbor                  : 31.0.0.1
Uptime                    : 00:32:55
State                     : route
Incoming interface        : vlan31
Outgoing Interface List :
Interface       State
-----------     ----------
vlan32          forwarding

switch#
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip mroute brief

`show ip mroute brief [al-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows brief version of the multicast routing information. Optionally, you can specify the display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows mroute information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the IP mroute brief:

```
switch# show ip mroute  brief
VRF : default
Total number of entries : 1

Group Address       Source Address      Neighbor            Interface
-------------       --------------      --------            ---------
239.1.1.1           40.0.0.6            10.1.1.2            vlan5
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip mroute group-addr

`show ip mroute <GROUP-ADDR> [<SOURCE-ADDR>] [all-vrfs | vrf <vrf-name>] [vsx-peer]`

Description

Shows the multicast routing information for the given group address. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<GROUP-ADDR>	Specifies a group address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
<SOURCE-ADDR>	Specifies show information for the group from this source in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
`all-vrfs`	Shows mroute information for the group for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing information for group 239.1.1.1 and VRF green:

```
switch# show ip mroute 239.1.1.1 vrf green

VRF : green

Group Address                 : 239.1.1.1
Source Address                : 40.0.0.5
Neighbor                      : 10.1.1.2
Incoming interface            : vlan1
Unicast Routing Protocol      : connected
Metric                        : 1234
Metric  Pref                  : 1234
Downstream Interface
Interface   State
---------   -----
vlan6       forwarding
```

Showing information for group 239.1.1.1 from source 40.0.0.5 and all VRFs:

```
switch# show ip mroute 239.1.1.1 40.0.0.5 all-vrfs

VRF : blue

Group Address                 : 239.1.1.1
Source Address                : 40.0.0.5
Incoming interface            : vlan3
Unicast Routing Protocol      : connected
Metric                        : 1234
Metric  Pref                  : 1234
Downstream Interface
Interface   State
---------   -----
vlan2       forwarding


VRF : green

Group Address                 : 239.1.1.1
Source Address                : 40.0.0.5
Neighbor                      : 10.1.1.2
Incoming interface            : vlan1
Unicast Routing Protocol      : connected
Metric                        : 1234
Metric  Pref                  : 1234
Downstream Interface
Interface   State
---------   -----
vlan6       forwarding
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip multicast anomalies

```
show ip multicast anomalies (pim | igmp | msdp | data-path | all) {source <source_ip>}
{group <group_ip>} {interface <IFNAME>} {vrf <vrf_name>} {all-vrfs}
```

Description

This command is used to display IPv4 multicast anomalies occurring across all the multicast modules in the system. Use this issue to troubleshoot current issues, or to detect multicast issues that occurred in the past by capturing the list of anomalies occurring across the multicast stack.

Parameter	Description
`pim`	Display multicast anomalies specific to PIM.
`igmp`	Display multicast anomalies specific to IGMP.
`msdp`	Display multicast anomalies specific to MSDP.
`data-path`	Display multicast anomalies specific to the datapath.
`all`	Display anomalies of all muticast modules.
`group <group_ip>`	Display multicast anomalies specific to the group.
`interface <IFNAME>`	Display multicast anomalies specific to an interface
`source <source_ip>`	Display multicast anomalies specific to a source.
`vrf <vrf-name>`	Display multicast anomalies specific to a VRF.
`all-vrfs`	Display multicast anomalies for all VRFs.

Examples

Showing datapath multicast anomalies for a specified group, interface and VRF.

```
switch# show ip multicast anomalies all all-vrfs

2022-02-18T09:28:40.272639+00:00 8320 pimd[2206]: MCAST_ANOMALY|IPV4|PIM|-
|100.1.1.1|224.0.0.2|VLAN20|VRF_BLUE| Dropping packet as max number of mroute or
nexthop is reached

2022-02-18T09:28:40.275256+00:00 8320 hpe-repld[2678]: MCAST_ANOMALY|-|DATA-PATH|-
|-|-|-|-|Could not allocate resources | linecard = e1937928-ceee-4027-a240-
aa54ba2de076 | err = Ingress resources exhausted

2022-02-18T09:28:40.283113+00:00 8320 ops-switchd[1214]: MCAST_ANOMALY|IPV4|DATA-
PATH|-|100.1.1.1|224.0.0.2|VLAN20|VRF_BLUE|Unable to add IPMC entry
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip multicast boundary interface

```
show ip multicast boundary interface <interface-name>
```

Description

Displays IP Multicast boundary ACL configurations and packet drop counters for the specified interface.

Examples

The following example displays IP multicast boundary information for interface **1/1/1**.

```
switch# show ip multicast boundary interface vlan50
IP Multicast Boundary Configurations
------------------------------------
access-list ip permitssm
    20 permit any any 225.0.0.0/255.0.0.0
    30 permit any any 230.0.0.0/255.0.0.0
    40 permit any any 232.0.0.0/255.0.0.0

IP Multicast Boundary Rx packet drop counters
---------------------------------------------
PIM Joins/Prunes           0
PIM BSM                    0
PIM C-RP Advertisements    0
PIM Asserts                0
Multicast Data Packets     0
IGMP Joins                 0
```

Related Commands

Command	Description
ip multicast boundary	This command configures administratively-scoped multicast boundaries on PIM-enabled Interfaces.

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command Introduced

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Users having admin privileges.

show ip pim

```
show ip pim [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the PIM router information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows PIM router information on all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

- In the 6400 Switch Series, In-Service Software Upgrade (ISSU) and multicast NSF are not supported in mixed mode.
- Multicast NSF is not supported for PIM RP enabled switches, therefore some transient traffic loss is expected during ISSU on RP routers where both PIM and MSDP are enabled.
- When PIM NSF status is inactive, the PIM NSF Time Remaining information is not shown.

Example

Showing IP PIM router information:

```
switch# show ip pim
```

```
PIM Global Parameters

VRF                                 :  default
PIM Status                          :  Enabled
PIM SSM Status                      :  Enabled
PIM SSM Range ACL                   :  pim_ssm_grp_range_acl
Join/Prune Interval (sec)           :  60
SPT Threshold                       :  Enabled
State Refresh Interval (sec)        :  60
PIM NSF Status                      :  Active
PIM NSF Time Remaining (HH:MM:SS)   :  00:01:21
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Added NSF information: PIM NSF status, PIM NSF Time Remaining
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rpf

show ip pim rpf [<source-ip-address> [<group-ip-address>]] [vrf <vrf-name> | all-vrfs]

Description

Shows PIM RPF details for the specified source or RP address in the given VRF. It shows the nexthop and interface through which shortest path to the source is available. Additionally, it prints if PIM neighborship is present on the nexthop. If VRF is not given, it displays for default VRF.

Parameter	Description
<IP-ADDR>	Show PIM RPF details for the given IPv4/IPv6 (X:X::X:X) address
`vrfs`	Shows PIM RPF information for specific VRF.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
`all-vrfs`	Shows PIM RPF details in all VRFs.

Examples

Showing PIM RPF for an IP address:

```
switch# [show ip pim rpf 1.1.1.1]

VRF: default
IP Address    RPF Interface  RPF Nexthop   PIM Neighbor  RPF Route/Mask   Origin
In Use
----------    -------------  -----------   ------------  --------------   ------
------
1.1.1.1       vlan10         10.1.1.1      yes           1.1.1.1/32       O
yes
```

Showing PIM RPF for all VRFs:

```
switch# [show ip pim rpf all-vrfs]

VRF: default
IP Address    RPF Interface  RPF Nexthop    PIM Neighbor  RPF Route/Mask   Origin
In Use
------------  -------------  -----------    ------------  --------------   ------
------
1.1.1.1       vlan10         10.1.1.1       yes           1.1.1.1/32       O
yes
10.1.1.1      vlan10         -              no            10.1.1.0/24      C
yes
10.1.1.2      vlan10         -              no            10.1.1.2/32      C
yes

VRF: red
IP Address    RPF Interface  RPF Nexthop    PIM Neighbor  RPF Route/Mask   Origin
In Use
----------    -------------  -----------    ------------  --------------   ------
------
2.2.2.2       vlan20         20.0.0.1       yes           2.2.2.2/32       SU
yes
20.0.0.1      vlan20         -              no            20.0.0.0/24      C
yes
20.0.0.2      vlan20         -              no            20.0.0.2/32      C
yes
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim bsr

```
show ip pim bsr [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the information about BSR candidates in the domain and multicast groups it supports. Optionally, you can specify the display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows PIM candidate BSR information for all VRFs.
`vrf <VRF-NAME>`	Optional. Shows PIM candidate BSR information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing information about BSR candidates:

```
switch# show ip pim bsr all-vrfs

Status and Counters- PIM-SM Bootstrap Router Information

VRF                          : default
E-BSR Address                : 10.0.0.1
E-BSR Priority               : 0
E-BSR Hash Mask Length       : 30
E-BSR Up Time                : 3000 secs
Next Bootstrap Message       : 80 secs

C-BSR Admin Status           : This system is a Candidate-BSR
C-BSR Address                : 2.2.2.2/24
C-BSR Priority               : 34
C-BSR Hash Mask Length       : 30
C-BSR Message Interval       : 76
C-BSR Source IP Interface : vlan10

C-RP Admin Status            : This system is a Candidate-RP
C-RP Address                 : 2.2.2.2
C-RP Hold Time               : 150
C-RP Advertise Period        : 60
C-RP Priority                : 192
C-RP Source IP Interface   : vlan10

Group Address     Group Mask
---------------   ---------------
226.2.2.2         255.255.255.255
228.2.2.2         255.255.255.255
232.2.2.2         255.255.255.255

VRF                          : green
E-BSR Address                : 2.2.2.2
```

```
E-BSR Priority              : 0
E-BSR Hash Mask Length      : 30
E-BSR Up Time               : 3000 secs
Next Bootstrap Message      : 80 secs

C-BSR Admin Status          : This system is a Candidate-BSR
C-BSR Address               : 2.2.2.2/24
C-BSR Priority              : 34
C-BSR Hash Mask Length      : 32
C-BSR Message Interval      : 60
C-BSR Source IP Interface : vlan10

C-RP Admin Status           : This system is a Candidate-RP
C-RP Address                : 2.2.2.2
C-RP Hold Time              : 150
C-RP Advertise Period       : 60
C-RP Priority               : 192
C-RP Source IP Interface    : vlan10

Group Address     Group Mask
---------------   ---------------
231.2.2.2         255.255.255.255
232.2.2.2         255.255.255.255
235.2.2.2         255.255.255.255
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim bsr elected

```
show ip  pim bsr elected [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows information about the elected BSR in the domain and multicast groups it supports. Optionally you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM elected bootstrap router information:

```
switch# show ip pim bsr elected all-vrfs

Status and Counters- PIM-SM Elected Bootstrap Router Information

VRF                          : default
E-BSR Address                : 10.0.0.1
E-BSR Priority               : 0
E-BSR Hash Mask Length       : 30
E-BSR Up Time                : 3000 secs
Next Bootstrap Message       : 80 secs

VRF                          : green
E-BSR Address                : 20.0.0.1
E-BSR Priority               : 0
E-BSR Hash Mask Length       : 30
E-BSR Up Time                : 3000 secs
Next Bootstrap Message       : 80 secs
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim bsr local

`show ip pim bsr local [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the information about BSR candidates on the local router and multicast groups it supports. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing local Candidate BSR:

```
switch# show ip pim bsr local all-vrfs

Status and Counters - PIM-SM Local Candidate-BSR Information

VRF                          : default
C-BSR Admin Status           : This system is a Candidate-BSR
C-BSR Address                : 2.2.2.2/24
C-BSR Priority               : 34
C-BSR Hash Mask Length       : 30
C-BSR Message Interval       : 76
C-BSR Source IP Interface : vlan10

VRF                          : green
C-BSR Admin Status           : This system is a Candidate-BSR
C-BSR Address                : 2.2.2.2/24
C-BSR Priority               : 34
C-BSR Hash Mask Length       : 32
C-BSR Message Interval       : 60
C-BSR Source IP Interface : vlan10
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim interface

```
show ip pim interface [brief | all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the information about PIM interfaces currently configured in the router. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`brief`	Specifies brief interface information
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the information about PIM interfaces currently configured in the router for the 6200, 6300, 6400, 8100, 8325, 8360, 9300, and 10000 switch series.

```
switch# show ip pim interface 1/1/2


PIM Interfaces

VRF: default
Interface: 1/1/2
Neighbor count: 2
IP Address:50.1.1.4/24
Mode: bidir
Designated Router: NA
Proxy DF: false
Hello Interval (sec): 30
Hello Delay (sec):5
Override Interval (msec): 2500        Lan Prune Delay: Yes
Propagation Delay (msec): 500         Configured DR Priority: NA
Operational DR Priority : NA
Neighbor Timeout: 105
```

Showing PIM interface information in brief for the default VRF:

```
switch(config)# show ip pim interface brief

-----------------------------------------------------------------------------------
--
           VRF : default                           Total number of interfaces : 4
-----------------------------------------------------------------------------------
--
Interface      IP Address              DR Address          Neighbor     Mode      VSX

                                                           count
```

```
Role
-----------    ------------------    ---------------     ---------    ------    ---
--
1/1/1          40.0.0.4/24           Nil                 1            bidir     NA

vlan10         50.1.1.1/24           Nil                 0            bidir     NA
vlan20         60.0.0.4/24           Nil                 1            bidir     NA
vlan30         30.10.10.2/24         Nil                 2            bidir     NA
loopback1      70.0.0.4/24           NA                  NA           bidir     NA
-----------------------------------------------------------------------------------
--
```

Showing PIM interface brief information for all VRFs:

```
switch(config)# show ip pim interface brief all-vrfs

-----------------------------------------------------------------------------------
--
           VRF : default                           Total number of interfaces : 1
-----------------------------------------------------------------------------------
--
Interface      IP Address            DR Address          Neighbor     Mode      VSX

                                                         count
Role
-----------    ------------------    ---------------     ---------    ------    ---
--
1/3/1          31.1.1.1/30           Nil                 0            sparse    N/A

-----------------------------------------------------------------------------------
--

-----------------------------------------------------------------------------------
--
           VRF : vrf1                              Total number of interfaces : 1
-----------------------------------------------------------------------------------
--
1/3/2          32.1.1.1/30           Nil                 0            sparse    N/A

-----------------------------------------------------------------------------------
--
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Added support for BIDIR PIM on the ,6300, 6400,, ,, ,switch series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim interface interface-name

```
show ip pim interface {<INTERFACE-NAME> [vsx-peer] | lag | loopback | tunnel |  vlan
<VLAN-ID> | vxlan} [vrf <VRF-NAME>]
```

Description

Shows detailed information about the PIM interface currently configured.

Parameter	Description
<INTERFACE-NAME>	Specifies an interface for showing PIM interface information.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.
LAG	Shows LAG interface information.
loopback	Shows loopback interface information.
tunnel	Shows tunnel interface information.
vlan *<VLAN-ID>*	Specifies an interface for showing PIM interface information.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
vxlan	Shows the VXLAN interface information.

Example

Showing PIM interface information for interface 1/1/2:

```
switch# show ip pim interface 1/1/2

PIM Interfaces

VRF: default

Interface  : 1/1/2
IP Address : 50.0.0.4/24
Mode       : sparse

Designated Router :
Hello Interval (sec)   : 30
Hello Delay (sec)      : 5

Override Interval (msec)   : 2500              Lan Prune Delay     : Yes
Propagation Delay (msec)   : 500               DR Priority         : 1
Neighbor Timeout           : 105
```

Showing the PIM interface information for VLAN 10:

```
switch# show ip pim interface vlan 10

PIM Interfaces

VRF: red

Interface      : vlan10
Neighbor count : 1
IP Address     : 100.100.1.1/24
Mode           : sparse

Designated Router      : 100.100.1.1
Proxy DR               : false
Hello Interval (sec)   : 30
Hello Delay (sec)      : 5

Override Interval (msec) : 2500        Lan Prune Delay : Yes
Propagation Delay (msec) : 500         DR Priority     : 1
Neighbor Timeout         : 83
```

Showing the PIM interface information for VLAN 10 when anycast neighbors are present:

```
switch# show ip pim interface vlan 10

PIM Interfaces

VRF: red

Interface      : vlan10
Neighbor count : 1
IP Address     : 100.100.1.1/24
Mode           : sparse

Designated Router      : 100.100.1.1
Proxy DR               : false
Hello Interval (sec)   : 30
Hello Delay (sec)      : 5

Override Interval (msec) : 2500        Lan Prune Delay : Yes
Propagation Delay (msec) : 500         DR Priority     : 1
Neighbor Timeout         : 83

Anycast Neighbors Present : True
DR State                  : Non-DR
Operational DR Priority   : 30529026
Elected DR priority       : 50529027
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim interface interface-name counters

`show ip pim interface <INTERFACE-NAME> counters [vsx-peer]`

Description

Shows the PIM packet counters information for the specified interface.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to show packet counter information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

Example

Showing PIM packet counters for interface 1/1/5:

```
Switch(config)# show ip pim interface 1/1/5 counters

Interface  : 1/1/5
VRF        : default

Tx Counters :

Hello                                    310
State Refresh                            0
Join/Prune                               141
SSM Join/Prune                           141
RP Advertisement                         0
Graft                                    0
Graft Ack                                0
Assert                                   0
Bsm                                      0
Register                                 0
Register Stop                            0
SSM Register Stop                        0

Rx Counters :

Hello                                    308
```

```
State Refresh                             0
Join/Prune                                0
SSM Join/Prune                            0
RP Advertisement                          0
Graft                                     0
Graft Ack                                 0
Assert                                    0
Bsm                                       0
Register                                  0
SSM Register                              0
Register Stop                             0
Register Drops(Register ACL hitcount)     0
Join/Prune Drops(RP ACL hitcount)         0

Rx Drop Counters :

Hello                                     0
State Refresh                             0
Join/Prune                                0
RP Advertisement                          0
Graft                                     0
Graft Ack                                 0
Assert                                    0
Bsm                                       0
Switch(config)#
```

Showing PIM packet counters for interface VLAN 1:

```
switch# show ip pim interface vlan1 counters

Interface           : vlan1
VRF                 : default

Rx Counters :

Hello                                   4
State Refresh                           0
Join/Prune                              1
RPadv                                   0
Graft                                   0
GraftAck                                0
Assert                                  0
Bsm                                     0
Register                                0
Register Stop                           0
Register Drops(Register ACL hitcount)   10
Join/Prune Drops(RP ACL hitcount)       5


Tx Counters :

Hello               9
State Refresh       0
Join/Prune          0
RPadv               0
Graft               0
GraftAck            0
Assert              0
Bsm                 0
Register            0
Register Stop       0
```

```
Invalid Rx Counters :

Hello                   0
State Refresh           0
Join/Prune              0
RPadv                   0
Graft                   0
GraftAck                0
Assert                  0
Bsm                     0
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rp

```
show ip pim rp [<group-ip>] [{vrf <vrf-name>}|all-vrfs]
```

Description

Displays the rendezvous point (RP) address for a particular group in the given VRF. The output of this command also includes the type of RP (static or dynamic) and the uptime for the mapping. This information can help verify that Group-to-RP mapping is consistent across all routers in the network. If the **group-ip** parameter is not included, the output of this command displays the group-to-RP mappings of those groups with active multicast traffic in the given VRF. If a VRF name is not specified, the output of this command displays information for the default VRF.

Parameter	Description
`<group-ip>`	Display group-to-RP mappings for the specified group.
`vrf` *`<VRF-NAME>`*	Specifies the name of a VRF. The default VRF is named **default**.
`all-vrfs`	Selects all VRFs.

Example

Showing RP mapping information for a single group:

```
switch# show ip pim rp 239.1.1.1

VRF: default

PIM-SM Group-to-Resultant_RP Mapping Information
Group Address   RP Address   RP Type  Up Time(HH:MM:SS)
-------------   ----------   -------  ----------------
239.1.1.1       20.1.1.1     bsr      12:01:20
```

Showing RP mapping for all VRFs:

```
switch# show ip pim rp all-vrfs
VRF: default

PIM-SM Group-to-Resultant_RP Mapping Information
Group Address   RP Address   RP Type  Up Time(HH:MM:SS)
-------------   ----------   -------  ----------------
239.1.1.1       20.1.1.1     bsr      15:10:45
239.1.1.2       40.1.1.1     static   05:07:30
239.1.1.3       Not Found    -        -

VRF: red

PIM-SM Group-to-Resultant_RP Mapping Information
Group Address   RP Address   RP Type  Up Time(HH:MM:SS)
-------------   ----------   -------  ----------------
225.1.1.1       100.1.1.5    bsr      15:11:50
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rp-registered-source

```
show ip pim rp-registered-sources <group-address> [source-address] [all-vrfs | vrf <vrf-name>]
```

Description

Displays the registered sources information on the RP router. This command shows information about the active multicast flows that are registered by the source designated router (DR) to this Rendezvous Point (RP). When the multicast source becomes inactive, the entry will be removed from this table. Note that this command displays only the set of flows that have been registered successfully for which the current router is the RP.

show ipv pim rp registered sources

```
show ip pim rp-registered-sources <group-address> [source-address] [all-vrfs | vrf <vrf-
name>]
```

Description

Shows information about active multicast flows that are registered by source DR to a specific RP.

Parameter	Description
`<group-address>`	Shows registered sources information for the group address. Format: **x.x.x.x**
`<source-address>`	(Optional) Shows registered sources information for the group from this source. Format: **x.x.x.x** Display registered sources information for group address.
`vrf` *`<VRF-NAME>`*	Displays registered sources information for a specific VRF.
`all-vrfs`	Displays registered sources information for all VRFs.

Example

The following example the registered sources information for all VRFs.

```
switch# show ip pim rp-registered-sources all-vrfs
Multicast flows registered with this RP
VRF : default
Total number of entries : 2
Source Address            Group Address           RP Address
--------------------      --------------------    --------------------
20.1.1.1                  225.1.1.4               2.2.2.2
20.1.1.1                  225.1.1.5               2.2.2.2

Multicast flows registered with this RP
VRF : red
Total number of entries : 2
Source Address            Group Address           RP Address
--------------------      --------------------    --------------------
30.1.1.1                  229.1.1.1               4.4.4.4
30.1.1.1                  229.1.1.2               4.4.4.4
```

The following example the registered sources information for a specific group and source address.

```
switch# show ip pim rp-registered-sources 229.1.1.10 30.1.1.1

Multicast flows registered with this RP
VRF : default
Total number of entries : 1
Source Address            Group Address           RP Address
--------------------      --------------------    --------------------
30.1.1.1                  229.1.1.10              4.4.4.4
```

```
PIM-SM Group-to-Resultant_RP Mapping Information
Group Address    RP Address    RP Type   Up Time(HH:MM:SS)
-------------    ----------    -------   ----------------
225.1.1.1        100.1.1.5     bsr       15:11:50
Showing RP mapping information for a single group:
```

```
Multicast flows registered with this RP
VRF : default
Total number of entries : 2
Source Address             Group Address            RP Address
--------------------       --------------------     --------------------
20.1.1.1                   225.1.1.4                2.2.2.2
20.1.1.1                   225.1.1.5                2.2.2.2

Multicast flows registered with this RP
VRF : red
Total number of entries : 2
Source Address             Group Address            RP Address
--------------------       --------------------     --------------------
30.1.1.1                   229.1.1.1                4.4.4.4
30.1.1.1                   229.1.1.2                4.4.4.4
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim neighbor

`show ip pim neighbor [<IP-ADDRESS>] [brief | all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows PIM neighbor information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<IP-ADDRESS>	Specifies an IP address.
`brief`	Specifies PIM neighbor information display in brief format.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM neighbor information for the , 6300, 6400,, , , , switch series.:

```
switch# show ip pim neighbor

PIM Neighbor

VRF                       : default
Total number of neighbors : 1

IP Address                : 30.1.1.3
Interface                 : vlan30
Up Time (HH:MM:SS)        : 03:55:40
Expire Time (HH:MM:SS)    : 00:01:23
DR Priority               : NA
Hold Time (HH:MM:SS)      : 00:01:45
Bidir Capable             : True
```

Showing PIM neighbor information in brief for the default VRF:

```
switch# show ip pim neighbor brief
----------------------------------------------------------------------------------
-
 VRF: default                 Total number of neighbor : 2
----------------------------------------------------------------------------------
-
Interface   Neighbor   Uptime      Expires     DR       Hold Time   Secondary
Address
            (IPV4)    (HH:MM:SS)  (HH:MM:SS)  Priority (HH:MM:SS)  (IPV4)
----------  --------  ---------   ---------   ------   ---------  ----------------
-
29091/1/1   40.0.0.5  11:54:21    00:01:31    NA       00:01:45   Nil
29101/1/2   50.0.0.5  00:03:23    00:01:23    NA       00:01:45
60.0.0.4,70.0.0.4
----------------------------------------------------------------------------------
-
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.13	Added support for BIDIR PIM on the , 6300, 6400,, , , , switch series.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim pending

`show ip pim pending [<GROUP-ADDR>] [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the pending joins on a PIM router. Optionally you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Use this command to determine what flows are being requested on the PIM network. If data availability for a flow is expected, and a join for the flow is pending, the troubleshooting search moves to the source of that flow, since the routers are verified to be seeing the request for data.

Parameter	Description
<GROUP-ADDR>	Specifies a group address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing pending PIM joins:

```
switch# show ip pim pending
Join Pending
VRF : default
   Group 234.0.20.4
       (*,G) Pending
            Incoming Interface:  1/1/32
   Group 234.0.20.5
```

```
       (*,G) Pending
            Incoming Interface:  1/2/32
   Group 234.0.20.6
       (*,G) Pending
            Incoming Interface:  1/1/32
   Group 234.0.20.7
       (*,G) Pending
            Incoming Interface:  1/1/2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rp-candidate

`show ip pim rp-candidate [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the candidate RP operational and configuration information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM RP candidate:

```
switch# show ip pim rp-candidate all-vrfs

 Status and Counters- PIM-SM Candidate-RP Information
```

```
VRF                        : Green
C-RP Admin Status          : This system is a Candidate-RP
C-RP Address               : 10.1.1.27
C-RP Hold Time             : 150
C-RP Advertise Period      : 60
C-RP Priority              : 192
C-RP Source IP Interface : Vlan10

Group Address   Group Mask
--------------- ---------------
239.10.10.240   255.255.255.252
236.0.0.0       255.255.255.0

VRF                        : Red
C-RP Admin Status          : This system is a Candidate-RP
C-RP Address               : 20.1.1.27
C-RP Hold Time             : 150
C-RP Advertise Period      : 60
C-RP Priority              : 192
C-RP Source IP Interface : Vlan20

Group Address   Group Mask
--------------- ---------------
239.10.10.240   255.255.255.252
236.0.0.0       255.255.255.0
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rp-set

`show ip pim rp-set [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the multicast group support for both the learned C-RP assignments and any statically configured RP assignments. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf` *`<VRF-NAME>`*	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM RP set information:

```
switch# show ip pim rp-set all-vrfs

VRF: default

Status and Counters - PIM-SM Static RP-Set Information
Group Address    Group Mask       RP Address       Override
---------------  ---------------  ---------------  --------
233.100.128.255  255.255.255.255  100.10.10.1      Yes
238.100.128.255  255.255.255.255  100.10.10.3      Yes

Status and Counters - PIM-SM Learned RP-Set Information
Group Address    Group Mask       RP Address       Hold Time  Expire Time
---------------  ---------------  ---------------  ---------  -----------
223.2.2.34       255.0.0.0        9.0.0.25         12         0

VRF: green

Status and Counters - PIM-SM Static RP-Set Information
Group Address    Group Mask       RP Address       Override
---------------  ---------------  ---------------  --------
226.102.128.255  255.255.255.255  105.10.10.3      Yes
234.102.128.255  255.255.255.255  110.10.10.3      Yes

Status and Counters - PIM-SM Learned RP-Set Information
Group Address    Group Mask       RP Address       Hold Time  Expire Time
---------------  ---------------  ---------------  ---------  -----------
223.2.2.34       255.0.0.0        9.0.0.25         12         0
229.2.2.34       255.0.0.0        9.0.0.25         10         0
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rp-set learned

`show ip pim rp-set learned [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the multicast group support for dynamically learned RP assignments. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM RP set learned information:

```
switch# show ip pim rp-set learned all-vrfs

VRF: default

Status and Counters - PIM-SM Learned RP-Set Information
Group Address    Group Mask       RP Address       Hold Time  Expire Time
---------------  ---------------  ---------------  ---------  -----------
223.2.2.34       255.0.0.0        9.0.0.25         12         0

VRF: green

Status and Counters - PIM-SM Learned RP-Set Information
Group Address    Group Mask       RP Address       Hold Time  Expire Time
---------------  ---------------  ---------------  ---------  -----------
223.2.2.34       255.0.0.0        9.0.0.25         12         0
229.2.2.34       255.0.0.0        9.0.0.25         10         0
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rp-set static

```
show ip pim rp-set static [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the multicast group support for statically configured RP assignments. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Selects all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM Static RP set information:

```
switch# show ip pim rp-set static all-vrfs

VRF: default

Status and Counters - PIM-SM Static RP-Set Information
Group Address    Group Mask       RP Address       Override
---------------  ---------------  ---------------  --------
233.100.128.255  255.255.255.255  100.10.10.1      Yes
238.100.128.255  255.255.255.255  100.10.10.3      Yes

VRF: green

Status and Counters - PIM-SM Static RP-Set Information
Group Address    Group Mask       RP Address       Override
---------------  ---------------  ---------------  --------
226.102.128.255  255.255.255.255  105.10.10.3      Yes
234.102.128.255  255.255.255.255  110.10.10.3      Yes
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rpf-override

`show ip pim rpf-override [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the RPF override configuration, which can be useful information when troubleshooting potential RPF misconfigurations. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF

Parameter	Description
`all-vrfs`	Optional. Shows PIM RPF override information for all VRFs.
`vrf <VRF-NAME>`	Optional. Shows PIM RPF override information for a particular VRF. If the **<VRF-NAME>** is not specified, it shows information for the default VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing PIM RPF override:

```
switch# show ip pim rpf-override all-vrfs

VRF                   : default
Static RPF Override
Multicast Source RPF IP Address
-------------------- ------------------
10.0.0.2/32           1.1.1.1

VRF                   : green
Static RPF Override
Multicast Source RPF IP Address
-------------------- ------------------
10.0.0.2/32           1.1.1.1
10.1.1.1/32           1.1.1.2
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rp-registered-source

```
show ip pim rp-registered-sources <group-address> [source-address] [all-vrfs | vrf <vrf-
name>]
```

Description

Displays the registered sources information on the RP router. This command shows information about the active multicast flows that are registered by the source designated router (DR) to this Rendezvous Point (RP). When the multicast source becomes inactive, the entry will be removed from this table. Note that this command displays only the set of flows that have been registered successfully for which the current router is the RP.

show ipv pim rp registered sources

```
show ip pim rp-registered-sources <group-address> [source-address] [all-vrfs | vrf <vrf-
name>]
```

Description

Shows information about active multicast flows that are registered by source DR to a specific RP.

Parameter	Description
`<group-address>`	Shows registered sources information for the group address. Format: **x.x.x.x**
`<source-address>`	(Optional) Shows registered sources information for the group from this source. Format: **x.x.x.x** Display registered sources information for group address.
`vrf` *`<VRF-NAME>`*	Displays registered sources information for a specific VRF.
`all-vrfs`	Displays registered sources information for all VRFs.

Example

The following example the registered sources information for all VRFs.

```
switch# show ip pim rp-registered-sources all-vrfs
Multicast flows registered with this RP
VRF : default
Total number of entries : 2
Source Address           Group Address           RP Address
--------------------     --------------------    --------------------
20.1.1.1                 225.1.1.4               2.2.2.2
20.1.1.1                 225.1.1.5               2.2.2.2

Multicast flows registered with this RP
VRF : red
Total number of entries : 2
Source Address           Group Address           RP Address
--------------------     --------------------    --------------------
30.1.1.1                 229.1.1.1               4.4.4.4
30.1.1.1                 229.1.1.2               4.4.4.4
```

The following example the registered sources information for a specific group and source address.

```
switch# show ip pim rp-registered-sources 229.1.1.10 30.1.1.1

Multicast flows registered with this RP
VRF : default
Total number of entries : 1
Source Address           Group Address           RP Address
--------------------     --------------------    --------------------
30.1.1.1                 229.1.1.10              4.4.4.4

PIM-SM Group-to-Resultant_RP Mapping Information
Group Address   RP Address   RP Type  Up Time(HH:MM:SS)
-------------   ----------   -------  ----------------
225.1.1.1       100.1.5      bsr      15:11:50
Showing RP mapping information for a single group:
```

```
Multicast flows registered with this RP
VRF : default
Total number of entries : 2
Source Address           Group Address           RP Address
--------------------     --------------------    --------------------
20.1.1.1                 225.1.1.4               2.2.2.2
20.1.1.1                 225.1.1.5               2.2.2.2

Multicast flows registered with this RP
VRF : red
Total number of entries : 2
Source Address           Group Address           RP Address
--------------------     --------------------    --------------------
30.1.1.1                 229.1.1.1               4.4.4.4
30.1.1.1                 229.1.1.2               4.4.4.4
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim rpf-override source

`show ip pim rpf-override source <IP-ADDR> [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the RPF override configuration for the specified source. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
source <IP-ADDR>	Specifies the RPF source address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255.
all-vrfs	Selects all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Showing PIM RPF override source:

```
switch# show ip pim rpf-override source 10.0.0.2

VRF                  : default
Static RPF Override
Multicast Source RPF IP Address
-------------------- ------------------
10.0.0.2             1.1.1.1
```

Showing PIM RPF override source for all VRFs:

```
switch# show ip pim rpf-override source 10.0.0.2 all-vrfs

VRF                  : default
```

```
Static RPF Override
Multicast Source RPF IP Address
-------------------- ------------------
10.0.0.2             1.1.1.1

VRF                  : green
Static RPF Override
Multicast Source RPF IP Address
-------------------- ------------------
10.0.0.2             1.1.1.1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim tree-state

```
show ip pim tree-state {<group-ip> [<source-ip>]}|brief [{vrf <vrf-name>}| all-vrfs]
```

Description

Displays upstream join states for a specified group and source address in a VRF.

The command displays upstream state, upstream interface and RPF neighbor used to send join messages and a list of downstream interfaces from which join messages are received.

The set of downstream interfaces in this command may not show the final list of outgoing interfaces for a flow, which is computed from various internal states and is shown in the output of the command show ip mroute.

Parameter	Description
`<group-ip>`	Shows PIM Join details for the specified group IP address
`<source-ip>`	Shows PIM Join details for the specified source IP address. If a source address is **not** specified, only *,G states are displayed for the specified group. If a source **address** is specified, (S,G) states are displayed along with (*,G) states and (S,G,RPT) states wherever

Parameter	Description
	applicable.
`brief`	Display brief details for the multicast group and source in a table format.
`vrf` *`<VRF-NAME>`*	Show join state details for the specified VRF.
`all-vrfs`	Show join state details for all VRFs.

Usage

The output of this command can indicate one of the following two multicast group (*,G) and multicast source and group (S,G) upstream states:

- **Joined** : Join sent to upstream RPF neighbor.
- **Not Joined** : Joins not sent upstream.

The following states are applicable to the multicast group (*G), and root path tree (S,G,RPT) only:

- **Pruned** : Traffic from the source is arriving on the shortest path tree, (*,G) Joined, but (S,G,RPT) pruned.
- **Not Pruned** : Traffic from the multicast group (*,G) Joined, and (S,G,rpt) not pruned.
- **RPT Not Joined**' : The multicast group (*,G) has not joined.

Examples

Display multicast group (*,G) join information for the VRF **red**.

```
show ip pim tree-state 239.1.1.1 vrf red
(*,G) Information for Group 239.1.1.1
VRF: red
Upstream Information:
State                          : Joined
Joined Interface               : vlan50
RPF Neighbor                   : 20.1.1.2
Uptime                         : 01:58:30
Downstream Information:
Interfaces                     : vlan50, vlan201
```

Display group (*,G), source and group (S,G), and root-path tree (S,G, RPT) Information for group **239.1.1.1** and source IP **30.1.1.1**.

```
show ip pim tree-state 239.1.1.1 30.1.1.1 vrf red
(*,G) Information for Group 239.1.1.1
VRF: red
Upstream Information:
State                          : Joined
Joined Interface               : vlan50
RPF Neighbor                   : 20.1.1.2
Uptime                         : 01:58:30
Downstream Information:
Interfaces                     : vlan200
(S,G) Information for Group 239.1.1.1 Source 30.1.1.1
Upstream Information:
```

```
State                         : Joined
Joined Interface              : vlan30
RPF Neighbor                  : 40.1.1.2
Uptime                        : 01:57:30
SPT bit set                   : True
Downstream Information:
Interfaces                    : vlan200
(S,G,RPT) Information for Group 239.1.1.1 Source 30.1.1.1
Upstream Information:
State                         : Pruned
Joined Interface              : vlan50
RPF Neighbor                  : 20.1.1.2
Uptime                        : 01:58:30
Downstream Information:
Interfaces                    : vlan200
```

Display brief information for the IP PIM tree state.

```
switch# show ip pim tree-state brief
State abbreviations :
J - Joined  NJ - Not Joined  RPTNJ - RPT Not Joined
P - Pruned  NP - Not Pruned
---------------------------------------------------------------------------------
VRF : default
---------------------------------------------------------------------------------
Group Address      Source Address     RPF          Uptime        State  Type
Neighbor     (HH:MM:SS)
-------------      --------------     -----------  ----------    ------ -------
239.1.1.1          *                  10.1.1.2     01:58:30      J      *,G
239.1.1.1          40.0.0.6           10.1.1.2     01:58:30      J      S,G
239.1.1.2          *                  10.1.1.2     01:58:30      J      *,G
239.1.1.2          40.0.0.6           20.1.1.2     01:58:30      J      S,G
239.1.1.2          40.0.0.6           10.1.1.2     01:58:30      P      S,G,RPT
---------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

sources-per-group

```
sources-per-group <limit>
no sources-per-group <limit>
```

Description

Configures the total number of sources allowed for a group on the router. By default, there is no limit on the number of sources for a group. When the number of sources for a group exceeds the configured limit, multicast traffic from additional sources will be dropped.

The **no** form of this command removes the currently configured limit value.

Parameter	Description
<limit>	Specifies the value to be configured as the sources allowed per group. Range: 1 to 4294967295.

Usage

Flows exceeding the limit will be programmed as a bridge entry and will not have the outgoing interfaces list populated. This configuration does not allow new sources for the group. At the time of configuration, if the device has more sources for the given group than the configured value, already allowed sources continue to exist until they are removed.

The flows are programmed in the HW on a FCFS basis. There could be scenarios where the flow is forwarded in neighbor router, but it may not be forwarded on the current router because of exceeding the limits configured on the current router. In such cases, it is recommended to configure higher limits to avoid traffic outage.

Examples

Configuring and removing the sources allowed per group:

```
switch(config)# router pim
switch(config-pim)# sources-per-group 4
switch(config-pim)# no sources-per-group
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-pim	Administrators or local user group members with execution rights for this command.

spt-threshold

```
spt-threshold
no spt-threshold
```

Description

Enables the router to switch the multicast traffic flows to the shortest path tree. Default is enabled.

The **no** form of this command disables the routers ability to switch the multicast traffic flows to the shortest path tree.

To apply this configuration a user needs to apply disable/enable PIM globally.

Example

Enabling and disabling the SPT threshold:

```
switch(config)# router pim
switch(config-pim)# spt-threshold
switch(config-pim)# no spt-threshold
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

Chapter 106

PIM-SM commands for IPv6

accept-register access-list

```
accept-register access-list <ACL-RULE>
no accept-register access-list <ACL-RULE>
```

Description

Configures ACL on RP to filter PIM Register packets from unauthorized sources. The ACL specified will contain the (S,G) traffic in register packets to permitted or denied.

The **no** form of this command removes the currently configured ACL rule.

Parameter	Description
<ACL-RULE>	Specifies the ACL rule name.

Usage

When register ACL is associated with a PIM Router, PIM protocol will store the source and destination address details along with the action (permit or deny).

Upon receiving the register messages, a look up is made to check if the S and G in the packet is in the permitted list. If there is no match or if there is a deny rule match, a register stop message is immediately sent and the packet is dropped and no further action is taken. Permitted packets will go through the normal flow.

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

Examples

Configuring ACL on RP with an ACL rule named **pim_regv6_acl**:

```
switch(config)# access-list ipv6 pim_regv6_acl
switch(config-acl-ipv6)# 10 permit any 20.::1 ff1e::1
switch(config-acl-ipv6)# 20 deny any 30::1 ff1e::3
switch(config)# router pim6
switch(config-pim6)# accept-register access-list pim_regv6_acl
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

accept-rp

```
accept-rp <IPv6-ADDR> access-list <ACL-RULE>
no accept-rp <IPv6-ADDR> access-list <ACL-RULE>
```

Description

Enables PIM router to filter PIM join/prune messages destined for a specific RP and specific groups. The ACL specifies the group addresses which are allowed or denied. Up to 8 RP addresses and group ACL can be associated with the PIM router.

The **no** form of this command removes the currently configured ACL rule.

Parameter	Description
<IPv6-ADDR>	Specifies an address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<ACL-RULE>	Specifies the ACL rule name.

Usage

PIM will store the accepted RP address and the associated group ACL. When a join or prune message is received, a RP look up is made for the packet. If the RP is in the configured list and if the group in the join/prune packet is allowed in the ACL, the packet is allowed. Otherwise the packet is dropped.

To allow join/prune message from any groups, group address in the ACL can be wild-carded. In this case, only RP address check is performed.

This command impacts only (*,G) join/prune messages. If there are any existing flows, the user will need to disable and enable PIM on the interface to apply the ACL.

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

If there is an active flow which is in the SPT, the traffic flow through the SPT will continue. Only (*,G) join/prune messages are dropped. (S,G) join/prune messages will not be impacted.

Examples

Configuring ACL on RP with an ACL rule named **pim_rpv6_grp_acl** to filter join/prune messages:

```
switch(config-pim)# access-list ip pim_rpv6_grp_acl
switch(config-acl-ipv6)# 10 permit any any ff2e::2/64
switch(config-acl-ipv6)# 20 permit any any ff1e::1/64
switch(config-acl-ipv6)# router pim6
switch(config-pim6)# accept-rp 30::1 access-list pim_rpv6_grp_acl
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

bsr-candidate bsm-interval

```
bsr-candidate bsm-interval <INTERVAL-VALUE>
no bsr-candidate bsm-interval
```

Description

Configures the interval in seconds to send periodic RP-Set messages to all PIM-SM interfaces on a router that operates as the BSR in a domain. This setting must be smaller than the **rp-candidate hold-time** settings (range of 30 to 255; default 150) configured in the RPs operating in the domain.

The **no** form of this command removes the currently configured value and sets it to the default of 60 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the BSR-candidate BSM interval in seconds. Range: 5 to 300. Default: 60.

Example

Configuring and removing BSR-candidate BSM-interval:

```
switch(config)# router pim6
switch(config-pim6)# bsr-candidate bsm-interval 150
switch(config-pim6)# no bsr-candidate bsm-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

bsr-candidate hash-mask-length

```
bsr-candidate hash-mask-length <LENGTH-VALUE>
no bsr-candidate hash-mask-length
```

Description

Controls the distribution of multicast groups among the C-RP, in a domain where there is overlapping coverage of the groups among the RPs. This value specifies the length (number of significant bits) when allocating this distribution. A longer hash-mask-length results in fewer multicast groups, for each block of group addresses assigned to the RPs. Multiple blocks of addresses assigned to each C-RP results in wider dispersal of addresses. Includes enhanced load-sharing for the multicast traffic for the different groups that are used in the domain at the same time.

The **no** form of this command removes currently configured value and sets to the default of 126.

Parameter	Description
<LENGTH-VALUE>	Specifies the length (in bits) of the hash mask. Range: 1 to 128. Default: 126.

Example

Configuring and removing the BSR-candidate hash-mask-length:

```
switch(config)# router pim6
switch(config-pim6)# bsr-candidate hash-mask-length 4
switch(config-pim6)# no bsr-candidate hash-mask-length
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

bsr-candidate priority

```
bsr-candidate priority <PRIORITY-VALUE>
no bsr-candidate priority
```

Description

Configures the priority to apply to the router when a BSR election process occurs in the PIM-SM domain. The candidate with the highest priority becomes the BSR for the domain. If the highest priority is shared by multiple routers, the candidate having the highest IP address becomes the BSR of the domain. Zero (0) is the lowest priority. To make BSR selection easily predictable, use this command to assign a different priority to each candidate BSR in the PIM-SM domain.

The **no** form of this command removes currently configured value and sets to the default of 0.

Parameter	Description
<PRIORITY-VALUE>	Specifies the priority for the Candidate Bootstrap router. Range: 0 to 255. Default: 0.

Example

Configuring and removing the BSR-candidate priority:

```
switch(config)# router pim6
switch(config-pim6)# bsr-candidate priority 250
switch(config-pim6)# no bsr-candidate priority
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

bsr-candidate source-ip-interface

```
bsr-candidate source-ip-interface <INTERFACE-NAME>
```

```
no bsr-candidate source-ip-interface <INTERFACE-NAME>
```

Description

Configures the router to advertise itself as a candidate PIM-SM BSR on the interface specified, and enables BSR candidate operation. The result makes the router eligible to be elected as the BSR for the PIM-SM domain in which it operates. One BSR candidate interface is allowed per-router.

The **no** form of this command removes the Candidate BSR configuration.

Parameter	Description
`<INTERFACE-NAME>`	Specifies the interface to use as a source for Candidate-BSR router IP address. Interface can be a VLAN interface, routed interface, or LAG. PIM-SM must be enabled on this interface with the command **ipv6 pimv6-sparse enable**.

Example

On the 6400 Switch Series, interface identification differs.

Configuring and removing the BSR-candidate interface:

```
switch(config)# router pim6
switch(config-pim6)# bsr-candidate source-ip-interface 1/1/4
switch(config-pim6)# no rp-candidate source-ip-interface 1/1/4
```

Configuring and removing the BSR-candidate sub-interface:

```
switch(config)# router pim6
switch(config-pim6)# bsr-candidate source-ip-interface 1/1/4
switch(config-pim6)# no rp-candidate source-ip-interface 1/1/4
```

Configuring sub-interface 1/1/19/10 as Candidate BSR:

```
switch(config)# router pim6
switch(config-pim6)# bsr-candidate source-ip-interface 1/1/19.10
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables PIMv6 globally on the router.

Using the **disable** command will cause all the multicast routes to be erased from hardware.

Example

Disabling PIM router:

```
switch(config)# router pim6
switch(config-pim6)# disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables PIMv6 globally on the router.

Example

Enabling PIM router:

```
switch(config)# router pim6
switch(config-pim6)# enable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

ipv6 mroute

```
ipv6 mroute <SRC-ADDR/SRC-MASK> <RPF-ADDRESS> | <INTERFACE-NAME>
```

Description

Configures multicast reverse path (RPF) forwarding static routes. This command is an alias of the **rpf-override** command.

The **no** form of this command removes the mroute configuration.

Parameter	Description
<SRC-ADDR>	Specifies the multicast source address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<SRC-MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
<RPF-ADDR>	Specifies the RPF address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<INTERFACE-NAME>	Specifies the RPF interface name.

Usage

Reverse Path Forward (RPF) checking is a core multicast routing mechanism. The RPF ensures that the multicast traffic received arrives on the expected router interface before further processing. If the RPF check fails for a multicast packet, the packet is discarded. For multicast traffic flow that arrives on the SPT, the expected incoming interface for a given source or group is the interface towards the source address of the traffic (determined by the unicast routing system). For traffic arriving on the RP tree, the expected incoming interface is the interface towards the RP.

RPF checking is applied to all multicast traffic and is significant in preventing network loops. Up to eight manual RPF overrides can be specified. The RPF-address indicates one of two distinct RPF candidates:

1. A valid PIM neighbor address from which forwarded multicast traffic is accepted with a source address of **<source-addr/src-mask>**.

2. A local router address on a PIM-enabled interface to which **<source-addr/src-mask>** is directly connected. If configured, the local router will assume the role of DR for this flow and registers the flow with an RP.

Example

Configuring and removing IP mroute:

```
switch(config-pim)# router pim6
switch(config-pim6)# ipv6 mroute 50::4/24 tunnel1
switch(config-pim6)# no ipv6 mroute 50::4/24 tunnel1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

ipv6 pim6-sparse

```
ipv6 pim6-sparse {enable | disable}
no ipv6 pim6-sparse [enable]
```

Description

Enables or disables PIM-SM on the current interface. PIM-SM is disabled by default on an interface. An IPv6 address must be configured on the interface to enable PIM-SM.

Parameter	Description
`enable`	Enables PIM-SM on the interface. IPv6 address must be configured on the interface to enable PIM-SM (use the **ipv6 address <X:X::X:X/M>** command).
`disable`	Disables PIM SM on the interface.

Examples

Enabling and disabling PIM-SM on an interface:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 address 2001::01/64
switch(config-if-vlan)# ipv6 pim6-sparse enable
switch(config-if-vlan)# ipv6 pim6-sparse disable
```

Enabling and disabling PIM-SM on a sub-interface:

```
switch(config)# interface 1/1/19.10
switch(config-subif)# ipv6 address 90::1/64
switch(config-subif)# ipv6 pim6-sparse enable
switch(config-subif)# ipv6 pim6-sparse disable
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse bfd

```
ipv6 pim6-sparse bfd [disable]
no ipv6 pim6-sparse bfd
```

Description

Configures BFD on a per-interface basis for an interface associated with the PIM process.

The **no** form of this command removes the BFD configuration on the interface and sets it to the default configuration.

If BFD is enabled globally, it will be enabled by default on all interfaces. The only exception is when it is disabled specifically on an interface using the **ipv6 pim6-sparse bfd disable** command.
If BFD is disabled globally, it will be disabled by default on all interfaces. The only exception is when it is enabled specifically on an interface using the **ipv6 pim6-sparse bfd** command.

Parameter	Description
`disable`	Disables the BFD configuration on the interface.

Examples

Enabling the BFD configuration on the interface:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ipv6 pim6-sparse bfd
```

Disabling the BFD configuration on the interface:

```
switch(config-if-vlan)# ipv6 pim6-sparse bfd disable
```

Removing the BFD configuration on the interface:

```
switch(config-if-vlan)# no ipv6 pim6-sparse bfd
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse dr-priority

```
ipv6 pim6-sparse dr-priority <PRIORITY-VALUE>
no ipv6 pim6-sparse dr-priority
```

Description

Changes the router priority for the designated router (DR) election process in the current interface.

A numerically higher value means a higher priority. If multiple routes share the highest priority, the router with the highest IP address is selected as the DR.

The **no** form of this command removes currently configured value and sets to the default of 1.

Parameter	Description
<PRIORITY-VALUE>	Specifies the priority value to use on the interface in the DR election process. Range: 0 to 4294967295. Default: 1.

Examples

Configuring and removing the interface priority value:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ipv6 pim6-sparse dr-priority 4444
switch(config-if-vlan)# no ipv6 pim6-sparse dr-priority
```

Configuring and removing the interface priority value:

```
switch(config)# interface 1/1/19.10
switch(config-if-vlan)# ipv6 pim6-sparse dr-priority 2000
switch(config-if-vlan)# no ipv6 pim6-sparse dr-priority
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if config-if-vlan config-lag-if config-subif	Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse hello-delay

```
ipv6 pim6-sparse hello-delay <DELAY-VALUE>
no ipv6 pim6-sparse hello-delay
```

Description

Configures the maximum time in seconds before the router actually transmits the initial PIM hello message on the current interface.

The **no** form of this command removes currently configured value and sets to the default of 5 seconds.

Parameter	Description
<DELAY-VALUE>	Specifies the hello-delay in seconds, which is the maximum time before a triggered PIM Hello message is transmitted on this interface. Range: 0 to 5. Default: 5.

Usage

- In cases where a new interface activates connections with multiple routers. If all the connected routers sent hello packets at the same time, the receiving router could become momentarily overloaded.

- This command randomizes the transmission delay to a time between zero and the hello delay setting. Using zero means no delay. After the router sends the initial hello packet to a newly detected interface, it sends subsequent hello packets according to the current hello interval setting.

Example

Configuring and removing hello-delay interface:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ipv6 pim6-sparse hello-delay 4
switch(config-if-vlan)# no ipv6 pim6-sparse hello-delay
```

Configuring and removing hello-delay on a sub-interface:

```
switch(config)# interface 1/1/19.10
switch(config-subif)# ipv6 pim6-sparse hello-delay 4
switch(config-subif)# no ipv6 pim6-sparse hello-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse hello-interval

```
ipv6 pim6-sparse hello-interval <INTERVAL-VALUE>
no ipv6 pim6-sparse hello-interval
```

Description

Configures the frequency at which the router transmits PIM hello messages on the current interface.

The **no** form of this command removes the currently configured value and sets to the default of 30 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the frequency at which PIM Hello messages are transmitted on this interface in seconds. Range: 5 to 300. Default: 30.

Usage

- The router uses hello packets to inform neighbor routers of its presence.
- The router also uses this setting to compute the hello holdtime, which is included in hello packets sent to neighbor routers.
- Hello holdtime tells neighbor routers how long to wait for the next hello packet from the router. If another packet does not arrive within that time, the router removes the neighbor adjacency on that interface from the PIM adjacency table, which removes any flows running on that interface.
- Shortening the hello interval reduces the hello holdtime. If they do not receive a new hello packet when expected, it changes how quickly other routers stop sending traffic to the router.

Example

Configuring and removing sparse hello-interval:

```
switch(config-if)# ipv6 pim6-sparse hello-interval 60
switch(config-if)# no ipv6 pim6-sparse hello-interval
```

Configuring and removing sparse hello-interval on a sub-interface:

```
switch)config)# interface 1/1/19.10
switch(config-subif)# ipv6 pim6-sparse hello-interval 100
switch(config-subif)# no ipv6 pim6-sparse hello-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse ipv6-addr

`ipv6 pim6-sparse ipv6-addr {<IPv6-ADDR-VALUE> | any}`

```
no ipv6 pim6-sparse ipv6-addr
```

Description

Enables the router to dynamically determine the source IP address to use for PIM-SM packets sent from the interface or to use the specific IPv6 address.

The **no** form of this command removes the currently configured value and sets to the default of **any**.

Parameter	Description
<IP-ADDR-VALUE>	Specifies the source IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
`any`	Specifies dynamically determining the source IP from the current IP address of the interface.

Examples

Configuring and removing source IP address:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-sparse ipv6-addr 2001::02
switch(config-if-vlan)# no ipv6 pim6-sparse ipv6-addr
```

Configuring and removing source IP address on a sub-interface:

```
switch(config)# interface 1/1/19.10
switch(config-subif)# ipv6 pim6-sparse ipv6-addr 2001:1::1
switch(config-if-vlan)# no ipv6 pim6-sparse ipv6-addr 2001:1::1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse lan-prune-delay

```
ipv6 pim6-sparse lan-prune-delay
no ipv6 pim6-sparse lan-prune-delay
```

Description

Enables the LAN prune delay option on the current interface. The default is enabled.

With LAN-prune-delay enabled, the router informs downstream neighbors how long it will wait before pruning a flow after receiving a prune request. Other downstream routers on the same interface must send a join to override the prune before the LAN-prune-delay time to continue the flow. Prompts any downstream neighbors with multicast receivers continuing to belong to the flow to reply with a join. If no joins are received after the LAN-prune-delay period, the router prunes the flow. The propagation-delay and override-interval settings determine the LAN-prune-delay setting.

The **no** form of this command disables the LAN prune delay option.

Example

Enabling and disabling the LAN prune delay:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-sparse lan-prune-delay
switch(config-if-vlan)# no ipv6 pim6-sparse lan-prune-delay
```

Enabling and disabling the LAN prune delay on a sub-interface:

```
switch(config)# interface 1/1/19.10
switch(config-subif)# ipv6 pim6-sparse lan-prune-delay
switch(config-subif)# no ipv6 pim6-sparse lan-prune-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if config-if-vlan config-lag-if config-subif	Administrators or local user group members with execution rights for this command.

ipv6 pim6-sparse override-interval

```
ipv6 pim6-sparse override-interval <INTERVAL-VALUE>
no ipv6 pim6-sparse override-interval
```

Description

Configures the override interval that gets inserted into the Override Interval field of a LAN Prune Delay option.

The **no** form of this command removes the currently configured value and sets the value to the default of 2500 ms.

Parameter	Description
<INTERVAL-VALUE>	Specifies the override interval of a LAN Prune Delay option in ms. Range: 500 to 6000. Default: 2500.

Usage

A router sharing a VLAN with other multicast routers uses the override-interval value along with the propagation-delay value to compute the **lan-prune-delay** setting. The setting specifies how long to wait for a PIM-SM join after receiving a prune packet from downstream for a particular multicast group.

Example scenario:

A network may have multiple routers sharing VLAN X. When an upstream router is forwarding traffic from multicast group X to VLAN Y, if one of the routers on VLAN Y does not want this traffic, it issues a prune response to the upstream neighbor. The upstream neighbor then goes into a prune pending state for group X on VLAN Y. During this period, the upstream neighbor continues to forward the traffic. During the pending period, another router on VLAN Y can send a group X join to the upstream neighbor. If this happens, the upstream neighbor drops the prune pending status and continues forwarding the traffic. But if no routers on the VLAN send a join, the upstream router prunes.

Example

Configuring and removing the override interval:

```
switch(config)# interface vlan40
switch(config-if-vlan)# ipv6 pim6-sparse override-interval 4000
switch(config-if-vlan)# no ipv6 pim6-sparse override-interval
```

Configuring and removing the override interval on a sub-interface:

```
switch(config)# interface 1/1/19.10
switch(config-subif)# ipv6 pim6-sparse override-interval 5000
switch(config-subif)# no ipv6 pim6-sparse override-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights

Platforms	Command context	Authority
6400	config-if-vlan config-lag-if config-subif	for this command.

ipv6 pim6-sparse propagation-delay

```
ipv6 pim6-sparse propagation-delay <DELAY-VALUE>
no ipv6 pim6-sparse propagation-delay
```

Description

Configures the propagation delay that gets inserted into the LAN prune delay field of a LAN Prune Delay option.

The **no** form of this command removes currently configured value and sets to the default of 500 ms.

Parameter	Description
<DELAY-VALUE>	Specifies the propagation delay value in ms. Range: 250 to 2000. Default: 500.

Examples

Configuring and removing the propagation delay:

```
switch(config)# interface vlan 40
switch(config-if-vlan)# ipv6 pim6-sparse propagation-delay 400
switch(config-if-vlan)# no ipv6 pim6-sparse propagation-delay
```

Configuring and removing the propagation delay on a sub-interface:

```
switch(config)# interface 1/1/19.10
switch(config-subif)# ipv6 pim6-sparse propagation-delay 1000
switch(config-subif)# no ipv6 pim6-sparse propagation-delay
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300	config-if	Administrators or local user group members with execution rights

Platforms	Command context	Authority

6400	`config-if-vlan`
	`config-lag-if`
	`config-subif`
		for this command.

join-prune-interval

```
join-prune-interval <INTERVAL-VALUE>
no join-prune-interval
```

Description

Configures the frequency at which the router will send periodic join or prune-interval messages.

The **no** form of this command sets the interval to the default value of 60 seconds.

Parameter	Description
<INTERVAL-VALUE>	Specifies the join-prune-interval in seconds. Range 5 to 65535. Default: 60.

Examples

Configuring join prune interval:

```
switch(config)# router pim6
switch(config-pim6)# join-prune-interval 400
switch(config-pim6)# no join-prune-interval
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

no ipv6 pim6-sparse

```
no ipv6 pim6-sparse
```

Description

Removes all the PIM-SM related IPv6 configurations for the interface.

Example

Removing PIM-SM configuration:

```
switch(config)# interface vlan40
switch(config-if-vlan)# no ipv6 pim6-sparse
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config-if`
	`config-if-vlan`
	`config-lag-if`
		Administrators or local user group members with execution rights for this command.

rp-address access list

```
rp-address <IPv6-ADDR> [access-list <ACL-NAME>][override]
no rp-address <IPv6-ADDR> [access-list <ACL-NAME>][override]
```

Description

Statically configures the router as the RP and associates the static RP to the specified ACL.

The **no** form of this command removes static RP ACL configuration.

Parameter	Description
`<IPv6-ADDR>`	Specifies an address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.
`access-list <ACL-NAME>`	Specifies the name of the access control list.
`override`	Specifies whether or not static RP configuration precedes the information learned by a BSR.

Usage

The ACL includes a list of permitted/ denied group addresses for the specified RP.

- When configured on a source DR, only permitted group addresses are registered to the RP. When applied on other routers, (*,G) PIM join/prune messages are filtered according to the applied ACL.

- Only destination group addresses in the ACEs are filtered and any other fields configured in the ACE are ignored. If only PIM (*,G) messages need to be filtered, configure **accept-rp** ACLs.
- When static RP ACL is configured, only one static RP can be configured per VRF and that configured RP handles all the multicast groups in range ff00::/8.

A change in the RP ACL does not impact the flows that have already switched to SPT. Only when the source information is expired and the RP is needed to establish the multicast tree, is the change in the ACL reflected. If the source is always active, PIM can be disabled and re-enabled to clear the learned sources information and re-establish multicast trees based on the latest RP ACL configurations.

Examples

Configuring the static RP ACL:

```
...
access-list ip static_rp6_acl
10 permit any any ff2e::2/64
20 permit any any ff1e::1/64

switch(config)# router pim6
switch(config-pim6)# rp-address 30::1 access-list static_rp6_acl
```

Removing the static RP ACL configuration:

```
switch(config-pim)# no rp-address 30::1 access-list static_rp6_acl
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Added optional access list parameter **[access-list <ACL-NAME>]**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rp-address

```
rp-address <IPv6-ADDR> [<GRP-ADDR/GRP-MASK>] [override]
no rp-address <IPv6-ADDR> [<GRP-ADDR/GRP-MASK>] [override]
```

Description

Statically configures the router as the RP for a specified multicast group or range of multicast groups. This must be configured on all PIM-SM routers in the domain. If group address is not specified, it applies to all IPv6 multicast addresses.

The **no** form of this command removes static RP configuration and its precedence.

Parameter	Description
<IPv6-ADDR>	Specifies an address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<GRP-ADDR>	Specifies the range of multicast group addresses in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<GRP-MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
`override`	Specifies higher precedence to static RP over Candidate RP.

Usage

Where a static RP and a C-RP are configured to support the same multicast groups and the multicast group mask for the static RP is equal to or greater than the same mask for the applicable C-RPs, this command assigns the higher precedence to the static RP, resulting in the C-RP operating only as a backup RP for the configured group. Without override, the C-RP has precedence over a static RP configured for the same multicast group or groups.

Examples

```
switch(config)# router pim6
switch(config-pim6)# rp-address 2001::01 ff08::1:3/64 ovverride
switch(config-pim6)# rp-address 2002::02 ff08::1:4/64
switch(config-pim6)# no rp-address 2002::02 ff08::1:4/64
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rp-candidate group-prefix

```
rp-candidate group-prefix <GRP-ADDR/GRP-MASK>
no rp-candidate group-prefix <GRP-ADDR/GRP-MASK>
```

Description

Adds multicast group address to the current Candidate Rendezvous Point (C-RP) configuration.

The **no** form of this command removes C-RP multicast group address.

Parameter	Description
<GRP-ADDR>	Specifies the multicast group address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<GRP-MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.

Examples

Configuring and removing candidate group prefix:

```
switch(config)# router pim6
switch(config-pim6)# rp-candidate group-prefix ff08::1:3/64
switch(config-pim6)# no rp-candidate group-prefix ff08::1:3/64
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

rp-candidate hold-time

```
rp-candidate hold-time <TIME-VALUE>
no rp-candidate hold-time
```

Description

Changes the hold-time a C-RP includes in its advertisements to the BSR.

Hold-time is included in the advertisements the C-RP periodically sends to the elected BSR for the domain. Also updates the BSR on how long to wait after the last advertisement from the reporting RP before assuming it has become unavailable.

The **no** form of this command removes the currently configured value and sets it to the default value 150 seconds.

Parameter	Description
<TIME-VALUE>	Specifies the hold-time value in seconds to be sent in C-RP-Adv messages. Range: 30 - 255. Default: 150.

Example

Setting and removing the candidate holdtime:

```
switch(config)# router pim6
switch(config-pim6)# rp-candidate hold-time 250
switch(config-pim6)# no rp-candidate hold-time
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

rp-candidate priority

```
rp-candidate priority <PRIORITY-VALUE>
no rp-candidate priority
```

Description

Changes the current priority setting for a C-RP. Where multiple C-RP configurations are used to support the same multicast groups, the candidate having the highest priority is elected. Zero (0) is the highest priority, and 255 is the lowest priority.

The **no** form of this command removes the currently configured value and sets it to the default of 192.

Parameter	Description
<PRIORITY-VALUE>	Specifies the priority value for the Candidate-RP router. Range: 0 to 255. Default: 192.

Example

Configuring and removing candidate priority:

```
switch(config)# router pim6
switch(config-pim6)# rp-candidate priority 250
switch(config-pim6)# no rp-candidate priority
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

rp-candidate source-ip-interface

```
rp-candidate source-ip-interface <INTERFACE-NAME> [group-prefix <GRP-ADDR/GRP-MASK>]
no rp-candidate source-ip-interface <INTERFACE-NAME> [group-prefix <GRP-ADDR/GRP-MASK>]
```

Description

Enables the Candidate Rendezvous Point (C-RP) operation, and configures the router to advertise itself as a C-RP to the Bootstrap Router (BSR) for the current domain.

This step includes the option to allow the C-RP to be a candidate for all possible multicast groups, or for up to four multicast groups, or ranges of groups. If group-prefix is not given, it considers for all multicast group addresses.

The **no** form of this command removes the C-RP configuration.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to use as a source for the C-RP router IP address.
`group-prefix` *<GRP-ADDR/GRP-MASK>*	Specifies the multicast group address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. And the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.

Examples

Configuring a C-RP using VLAN 40 as the source for the C-RP router IP address and associating the ff08::1:3/64 multicast group with the C-RP router:

```
switch(config)# router pim6
switch(config-pim6)# rp-candidate source-ip-interface vlan40 group-prefix
ff08::1:3/64
```

Configuring a C-RP using loopback1 as the source for the C-RP router IP address and associating the ff08::1:3/64 multicast group with the C-RP router:

```
switch(config)# router pim6
switch(config-pim6)# rp-candidate source-ip-interface loopback1 group-prefix
ff08::1:3/64
```

Configuring sub-interface 1/1/19.10 as candidate RP:

```
switch(config)# router pim6
switch(config-pim6)# rp-candidate source-ip-interface 1/1/19.10
```

Removing the candidate source IP interface:

```
switch(config-pim6)# no rp-candidate source-ip-interface vlan20
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

rpf-override

```
rpf-override <SRC-ADDR/SRC-MASK> <RPF-ADDR|INTERFACE-NAME>
no rpf-override <SRC-ADDR/SRC-MASK> <RPF-ADDR|INTERFACE-NAME>
```

Description

The Reverse Path Forward (RPF) override, allows overriding the normal RPF lookup mechanism, and indicates to the router that it may accept multicast traffic on an interface other than the one that the RPF lookup mechanism would normally select. This includes accepting traffic from an invalid source IP address for the subnet or VLAN that is directly connected to the router. Traffic may also be accepted from a valid PIM neighbor that is not on the reverse path towards the source of the received multicast traffic.

The **no** form of this command removes currently configured RPF entry.

Parameter	Description
<SRC-ADDR>	Specifies the multicast source address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<SRC-MASK>	Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128.
<RPF-ADDR>	Specifies the RPF address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<INTERFACE-NAME>	Specifies the RPF interface name.

Usage

Reverse Path Forward (RPF) checking is a core multicast routing mechanism. The RPF ensures that the multicast traffic received arrives on the expected router interface before further processing. If the RPF check fails for a multicast packet, the packet is discarded. For multicast traffic flow that arrives on the SPT, the expected incoming interface for a given source or group is the interface towards the source address of the traffic (determined by the unicast routing system). For traffic arriving on the RP tree, the expected incoming interface is the interface towards the RP.

RPF checking is applied to all multicast traffic and is significant in preventing network loops. Up to eight manual RPF overrides can be specified. The RPF-address indicates one of two distinct RPF candidates:

1. A valid PIM neighbor address from which forwarded multicast traffic is accepted with a source address of **<source-addr/src-mask>**.
2. A local router address on a PIM-enabled interface to which **<source-addr/src-mask>** is directly connected. If configured, the local router will assume the role of DR for this flow and registers the flow with an RP.

Example

Configuring and removing RPF override:

```
switch(config)# router pim6
switch(config-pim6)# rpf-override 50::4/24 40::1
switch(config-pim)# no rpf-override 50::4/24 40::1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

show ipv6 mroute <*GROUP-ADDR*>

```
show ipv6 mroute <GROUP-ADDR> [<SOURCE-ADDR>] [all-vrfs | vrf <vrf-name>] [vsx-peer]
```

Description

Shows the multicast routing information for the given group address. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<GROUP-ADDR>	Specifies a group address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
<SOURCE-ADDR>	Specifies a source IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
`all-vrfs`	Shows information for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing information for group ff08::1:3 and VRF green:

```
switch# show ipv6 mroute  ff08::1:3 vrf green

VRF : green

Group Address           : ff08::1:3
Source Address          : 2001::03
Neighbor                : 2003::04
Incoming interface      : 1/1/1
Outgoing Interface List :
Interface      State
---------      -----
1/1/4          pruned
```

Showing information for group ff08::1:3 from source 2001::03 and all VRFs:

```
switch# show ipv6 mroute  ff08::1:3 2001::03 all-vrfs

VRF : blue
```

```
Group Address            : ff08::1:3
Source Address           : 2001::03
Neighbor                 : 2003::04
Incoming interface       : 1/1/1
Outgoing Interface List :
Interface      State
---------      -----
1/1/4          pruned


VRF : green

Group Address            : ff08::1:3
Source Address           : 2001::03
Neighbor                 : 2003::04
Incoming interface       : 1/1/2
Outgoing Interface List :
Interface      State
---------      -----
1/1/4          pruned
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 mroute

```
show ipv6 mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not

Parameter	Description
	have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing IPv6 mroute information for the default VRF:

```
Switch# show ipv6 mroute
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : ff32::10
Source Address           : fd00:192:168:20::2
SSM Mroute               : True
Neighbor                 : fe80::f403:4301:1422:2600
Uptime                   : 00:14:05
State                    : route
Incoming interface       : 1/1/5
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding
```

Showing IPv6 mroute information for all VRFs:

```
switch# do show ipv6 mroute all-vrfs
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : ff32::10
Source Address           : fd00:192:168:2::100
SSM Mroute               : True
Neighbor                 : fe80::eceb:b801:14e4:2900
Uptime                   : 00:19:20
State                    : route
Incoming interface       : 1/1/4
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding

VRF : red
Total number of entries : 1

Group Address            : ff32::11
Source Address           : 30::3
SSM Mroute               : True
Neighbor                 : fe80::eceb:b880:1fe4:2900
Uptime                   : 00:01:13
State                    : route
Incoming interface       : vlan31
Outgoing Interface List :
Interface       State
```

```
-----------      ----------
vlan32           forwarding
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 mroute brief

`show ipv6 mroute brief [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows brief version of the multicast routing information. Optionally, you can specify the display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows mroute information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the IPv6 mroute brief:

```
switch# show ipv6 mroute brief all-vrfs
IP Multicast Route Entries

VRF : blu
Total number of entries : 2

Group Address  : ff08::1:3
Source Address : 2002::04
Neighbor       : 2003::04
```

```
Interface       : 1/1/2

Group Address  : ff08::1:4
Source Address : 2002::03
Neighbor       : 2003::05
Interface       : 1/1/3

VRF : default
Total number of entries : 1

Group Address  : ff08::1:5
Source Address : 2001::03
Neighbor       : 2002::01
Interface       : 1/1/1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6

```
show ipv6 pim6 [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the PIM router information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the IPv6 PIM router:

```
switch# show ipv6 pim6

PIM Global Parameters

VRF                             :  default
PIM Status                      :  Enabled
Join/Prune Interval (sec)       :  46
SPT Threshold                   :  Disabled
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 bsr

`show ipv6 pim6 bsr [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the information about BSR candidates in the domain and multicast groups it supports. Optionally, you can specify the display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing information about BSR candidates:

```
switch# show ipv6 pim6 bsr all-vrfs

Status and Counters- PIM-SM(IPv6) Bootstrap Router Information

VRF                        : blu
E-BSR Address              : 2006::06
E-BSR Priority             : 0
E-BSR Hash Mask Length     : 0
E-BSR Up Time              : 0 secs
Next Bootstrap Message     : 0 secs

C-BSR Admin Status         : This system is a Candidate-BSR
C-BSR Address              : 2007::01
C-BSR Priority             : 40
C-BSR Hash Mask Length     : 36
C-BSR Message Interval     : 50
C-BSR Source IP Interface : lag1

C-RP Admin Status          : This system is a Candidate-RP
C-RP Address               : 2007::01
C-RP Hold Time             : 60
C-RP Advertise Period      : 60
C-RP Priority              : 46
C-RP Source IP Interface   : lag1

Group Prefix   : ff00::/8
Group Prefix   : ff08::1:3/64
Group Prefix   : ff08::1:4/64

VRF                        : default
E-BSR Address              : 2001::01
E-BSR Priority             : 40
E-BSR Hash Mask Length     : 36
E-BSR Up Time              : 53 mins
Next Bootstrap Message     : 88 secs

C-BSR Admin Status         : This system is a Candidate-BSR
C-BSR Address              : 2001::01
C-BSR Priority             : 40
C-BSR Hash Mask Length     : 36
C-BSR Message Interval     : 50
C-BSR Source IP Interface : 1/1/1

C-RP Admin Status          : This system is a Candidate-RP
C-RP Address               : 2001::01
C-RP Hold Time             : 60
C-RP Advertise Period      : 60
C-RP Priority              : 46
C-RP Source IP Interface   : 1/1/1

Group Prefix   : ff00::/8
Group Prefix   : ff08::1:5/64
Group Prefix   : ff08::1:6/64
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 bsr elected

```
show ipv6 pim6 bsr elected [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows information about the elected BSR in the domain and multicast groups it supports. Optionally you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM elected bootstrap router information:

```
switch# show ipv6 pim6 bsr elected all-vrfs

Status and Counters - PIM-SM(IPv6) Elected Bootstrap Router Information

VRF                          : blu
E-BSR Address                : 2005::05
E-BSR Priority               : 0
E-BSR Hash Mask Length       : 0
E-BSR Up Time                : 0 secs
Next Bootstrap Message       : 0 secs

VRF                          : default
E-BSR Address                : 2002::02
E-BSR Priority               : 0
E-BSR Hash Mask Length       : 30
E-BSR Up Time                : 50 mins
Next Bootstrap Message       : 88 secs
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 bsr local

```
show ipv6 pim6 bsr local [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the information about BSR candidates on the local router and multicast groups it supports. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing local Candidate BSR:

```
switch# show ipv6 pim6 bsr local all-vrfs

Status and Counters - PIM-SM(IPv6) Local Candidate-BSR Information

VRF                          : blu
C-BSR Admin Status           : This system is a Candidate-BSR
C-BSR Address                : 2007::01
C-BSR Priority               : 40
C-BSR Hash Mask Length       : 36
C-BSR Message Interval       : 50
C-BSR Source IP Interface : lag1
```

```
VRF                          : default
C-BSR Admin Status           : This system is a Candidate-BSR
C-BSR Address                : 2001::01
C-BSR Priority               : 40
C-BSR Hash Mask Length       : 36
C-BSR Message Interval       : 50
C-BSR Source IP Interface : 1/1/1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 interface <*INTERFACE-NAME*>

```
show ipv6 pim6 interface <INTERFACE-NAME> [vsx-peer]
```

Description

Shows detailed information about the PIM interface currently configured.

Parameter	Description
<INTERFACE-NAME>	Specifies an interface for showing PIM interface information. Interface can also be a LAG or VLAN.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing PIM interface information for interface 1/1/1:

```
switch# show ipv6 pim6 interface 1/1/1

PIM Interfaces
```

```
VRF: default

Interface   : 1/1/1
IPv6 Address : fe80::a00:9ff:feec:dc0e/64
Mode        : sparse

Designated Router :
Hello Interval (sec)   : 30
Hello Delay (sec)      : 4

Override Interval (msec)   : 500                 Lan Prune Delay      : Yes
Propagation Delay (msec)   : 350                 DR Priority          : 3
Neighbor Timeout           : 0
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 interface

```
show ipv6 pim6 interface [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the information about PIM interfaces currently configured in the router. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM interface:

```
switch# show ipv6 pim6 interface
PIM Interfaces

VRF: default

Interface           IP Address
mode
------------------- ---------------------------------------------------------------
----------
1/1/1               fe80::a00:9ff:feec:dc0e/64
sparse
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 neighbor

```
show ipv6 pim6 neighbor [<IPv6-ADDR>] [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows PIM neighbor information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
<IPv6-ADDR>	Specifies a neighbor address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
all-vrfs	Shows information for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing PIM neighbor information:

```
switch# show ipv6 pim6 neighbor

PIM Neighbor

VRF                   : default
IP Address            : 2001::02
Interface             : 1/1/1
Up Time (sec)         : 0
Expire Time (sec)     : 0
DR Priority           : 44
```

Showing PIM neighbor information (including the presence of anycast neighbors) for all VRFs:

```
switch# show ipv6 pim6 neighbor all-vrfs

PIM Neighbor


VRF                         : red
Total number of neighbors : 2

IPv6 Address                : fe80::5:5:5:5
Interface                   : vni10000
Up Time (HH:MM:SS)          : 06:57:07
Expire Time (HH:MM:SS)      : 00:03:26
DR Priority                 : 1
Hold Time (HH:MM:SS)        : 00:03:30

IPv6 Address                : fe80::3821:c780:a5c:18c0
Interface                   : vlan10
Up Time (HH:MM:SS)          : 00:01:46
Expire Time (HH:MM:SS)      : 00:01:29
DR Priority                 : 1
Hold Time (HH:MM:SS)        : 00:01:45
Secondary IP Addresses     :100:100::3
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 pending

```
show ipv6 pim6 pending [<GROUP-ADDR>] [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the pending joins on a PIM router. Optionally you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Use this command to determine what flows are being requested on the PIM network. If data availability for a flow is expected, and a join for the flow is pending, the troubleshooting search moves to the source of that flow, since the routers are verified to be seeing the request for data.

Parameter	Description
<GROUP-ADDR>	Specifies a group address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
`all-vrfs`	Shows information for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

On the 6400 Switch Series, interface identification differs.

Showing pending PIM joins:

```
switch# show ipv6 pim6 pending
Join Pending

VRF : default
   Group ff08::1:3
       (*,G) Pending
            Incoming Interface:  1/1/1
   Group ff08::1:4
       (*,G) Pending
            Incoming Interface:  1/1/1
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rp

```
show ipv6 pim6 rp [<group-ip>] [{vrf <vrf-name>}|all-vrfs]
```

Description

Displays the rendezvous point (RP) address for a particular group in the given VRF. The output of this command also includes the type of RP (static or dynamic) and the uptime for the mapping. This information can help verify that Group-to-RP mapping is consistent across all routers in the network. If the **group-ip** parameter is not included, the output of this command displays the group-to-RP mappings of those groups with active multicast traffic in the given VRF. If a VRF name is not specified, the output of this command displays information for the default VRF.

Parameter	Description
`<group-ip>`	Display group-to-RP mappings for the specified group.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. The default VRF is named **default**.
`all-vrfs`	Selects all VRFs.

Example

Showing RP mapping information for a single group:

```
switch# show ipv6 pim6 rp ff57::3

VRF: default

PIM-SM(IPv6) Group-to-Resultant_RP Mapping Information

Group Address       : ff57::3
RP Address          : Not Found
RP Type             : -
Up Time (HH:MM:SS)  : -
```

Showing RP mapping for all VRFs:

```
switch# show ipv6 pim6 rp all-vrfs

VRF: default

PIM-SM(IPv6) Group-to-Resultant_RP Mapping Information

Group Address       : ff56::7
RP Address          : 2002::2
RP Type             : bsr
Up Time (HH:MM:SS)  : 00:45:20
```

```
VRF: red

PIM-SM(IPv6) Group-to-Resultant_RP Mapping Information

Group Address       : ff55::5
RP Address          : 4001::1
RP Type             : static
Up Time (HH:MM:SS)  : 02:33:50

Group Address       : ff55::6
RP Address          : 3003::3
RP Type             : bsr
Up Time (HH:MM:SS)  : 01:30:05
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rpf

show ipv6 pim6 rpf [<source-ip-address> [<group-ip-address>]] [vrf <vrf-name> | all-vrfs]

Description

Shows PIM RPF details for the specified source or RP address in the given VRF. It shows the nexthop and interface through which shortest path to the source is available. Additionally, it prints if PIM neighborship is present on the nexthop. If VRF is not given, it displays for default VRF.

Parameter	Description
<IP-ADDR>	Show PIM RPF details for the given IPv4/IPv6 (X:X::X:X) address
vrfs	Shows PIM RPF information for specific VRF.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
all-vrfs	Shows PIM RPF details in all VRFs.

Examples

Showing PIM RPF for VRF red:

```
switch# show ipv6 pim6 rpf vrf red

Multicast RPF Details
Origin Codes: C - connected, SM - static-multicast, SU - static-unicast
              O - OSPF, B - BGP, R - RIP
VRF: red
IP Address      : 2000::2
RPF Interface   : vlan20
RPF Nexthop     : -
PIM Neighbor    : no
RPF Route/Mask  : 2000::2/128
Origin          : C
In Use          : yes

IP Address      : 2222::2
RPF Interface   : vlan20
RPF Nexthop     : fe80::94f1:2880:141d:a800
PIM Neighbor    : yes
RPF Route/Mask  : 2222::2/128
Origin          : O
In Use          : yes
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rp-candidate

```
show ipv6 pim6 rp-candidate [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the candidate RP operational and configuration information. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM RP candidate:

```
switch# show ipv6 pim6 rp-candidate all-vrfs

 Status and Counters- PIM-SM(IPv6) Candidate-RP Information

VRF                          : blu
C-RP Admin Status            : This system is a Candidate-RP
C-RP Address                 : 2007::01
C-RP Hold Time               : 60
C-RP Advertise Period        : 60
C-RP Priority                : 46
C-RP Source IP Interface     : lag1

Group Prefix    : ff00::/8
Group Prefix    : ff08::1:3/64
Group Prefix    : ff08::1:4/64


VRF                          : default
C-RP Admin Status            : This system is a Candidate-RP
C-RP Address                 : 2001::01
C-RP Hold Time               : 60
C-RP Advertise Period        : 60
C-RP Priority                : 46
C-RP Source IP Interface     : 1/1/1

Group Prefix    : ff00::/8
Group Prefix    : ff08::1:5/64
Group Prefix    : ff08::1:6/64
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rpf-override

`show ipv6 pim6 rpf-override [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows the RPF override configuration, which can be useful information when troubleshooting potential RPF misconfigurations. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM RPF override:

```
switch# show ipv6 pim6 rpf-override all-vrfs

VRF : Green
Static RPF Override
Multicast Source : 2003::1/128
RPF IPv6 Address : 2001::01
Multicast Source : 2005::1/128
RPF IPv6 Address : 2007::01
VRF : Red
Static RPF Override
Multicast Source : 2004::02/128
RPF IPv6 Address : 2002::02
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rp-registered-source

```
show ipv6 pim6 rp-registered-sources all-vrfs
```

Description

Displays the registered sources information on the RP router. This command shows information about the active multicast flows that are registered by the source designated router (DR) to this Rendezvous Point (RP). When the multicast source becomes inactive, the entry will be removed from this table. Note that this command displays only the set of flows that have been registered successfully for which the current router is the RP.

show ipv6 pim6 rp registered sources

```
show ipv6 pim6 rp-registered-sources <group-address> [source-address] [all-vrfs | vrf
<vrf-name>]
```

Description

Shows information about active multicast flows that are registered by source DR to a specific RP.

Parameter	Description	
`<group-address>`	Shows registered sources information for the group address. Format: **X:X::X:X** group-address	Shows registered sources information for the group address
`<source-address>`	(Optional) Shows registered sources information for the group from this source. Format **:X:X::X:X** source-address	Shows registered sources information for the group from selected source.
`vrf` *`<VRF-NAME>`*	Displays registered sources information for a specific VRF.	Shows registered sources information on all VRFs
`all-vrfs`	Displays registered sources information for all VRFs. all-vrfs	
vrf	Shows registered sources information for specific VRF	
vrf-name	Shows registered sources information for the given VRF	

Example

Showing information about rp-registered-sources in all-vrfs:

```
switch# show ipv6 pim6 rp-registered-sources all-vrfs

Multicast flows registered with this RP
VRF : default
Total number of entries : 1
Source Address           Group Address           RP Address
--------------------    --------------------    --------------------
2001::1                  ff55::5                 2002::2

Multicast flows registered with this RP
VRF : red
Total number of entries : 1
Source Address           Group Address           RP Address
---------------------    ---------------------    ---------------------
3001::1                  ff99::5                 3002::2
```

The following example the registered sources information for a specific group and source address.

```
switch# show ipv6 pim6 rp-registered-sources ff55::5 2001::1

Multicast flows registered with this RP
VRF : default
Total number of entries : 1
Source Address           Group Address           RP Address
---------------------    ---------------------    ---------------------
2001::1                  ff55::5                 3333::3
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rpf-override source

```
show ipv6 pim6 rpf-override source <IPv6-ADDR> [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the RPF override configuration for the specified source. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`source <IPv6-ADDR>`	Specifies the RPF source address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F.
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing PIM RPF override source:

```
switch# show ipv6 pim6 rpf-override source 2004::02

VRF : default
Static RPF Override
Multicast Source : 2004::02/128
RPF IPv6 Address : 2002::02
```

Showing PIM RPF override source for all VRFs:

```
switch# show ipv6 pim6 rpf-override source 2004::02 all-vrfs

VRF : Red
Static RPF Override
Multicast Source : 2004::02/128
RPF IPv6 Address : 2002::02
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rp-set

```
show ipv6 pim6 rp-set [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the multicast group support for both the learned C-RP assignments and any statically configured RP assignments. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf` *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM RP set information:

```
switch# show ipv6 pim6 rp-set all-vrfs

VRF: blu

Status and Counters - PIM-SM(IPv6) Static RP-Set Information

Group Prefix  : ff00::/8
RP Address    : 2004::04
Override [No] : No

Status and Counters - PIM-SM(IPv6) Learned RP-Set Information

Group Prefix       : ff08::1:3/64
RP Address         : 2007::01
Hold Time (sec)    : 60
Expire Time (sec)  : 0
Group Prefix       : ff08::1:4/64
RP Address         : 2007::01
Hold Time (sec)    : 60
Expire Time (sec)  : 92

VRF: default

Status and Counters - PIM-SM(IPv6) Static RP-Set Information

Group Prefix  : ff00::/8
RP Address    : 2003::03
Override [No] : No

Status and Counters - PIM-SM(IPv6) Learned RP-Set Information

Group Prefix       : ff08::1:5/64
RP Address         : 2001::01
Hold Time (sec)    : 60
Expire Time (sec)  : 0
Group Prefix       : ff08::1:6/64
RP Address         : 2002::01
```

```
Hold Time (sec)     : 60
Expire Time (sec)   : 92
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rp-set learned

```
show ipv6 pim6 rp-set learned [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the multicast group support for dynamically learned RP assignments. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
all-vrfs	Shows information for all VRFs.
vrf *<VRF-NAME>*	Specifies the name of a VRF. Default: default.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM RP set learned information:

```
switch# show ipv6 pim6 rp-set learned all-vrfs

VRF: blu

Status and Counters - PIM-SM(IPv6) Learned RP-Set Information
Group Prefix        : ff08::1:3/64
RP Address          : 2007::01
Hold Time (sec)     : 60
Expire Time (sec)   : 0
```

```
Group Prefix        : ff08::1:4/64
RP Address          : 2007::01
Hold Time (sec)     : 60
Expire Time (sec)   : 92

VRF: default

Status and Counters - PIM-SM(IPv6) Learned RP-Set Information
Group Prefix        : ff08::1:5/64
RP Address          : 2001::01
Hold Time (sec)     : 60
Expire Time (sec)   : 0
Group Prefix        : ff08::1:6/64
RP Address          : 2002::01
Hold Time (sec)     : 60
Expire Time (sec)   : 92
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 rp-set static

```
show ipv6 pim6 rp-set static [all-vrfs | vrf <VRF-NAME>] [vsx-peer]
```

Description

Shows the multicast group support for statically configured RP assignments. Optionally, you can specify display information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing PIM Static RP set information:

```
switch# show ipv6 pim6 rp-set static all-vrfs

VRF: blu

Status and Counters - PIM-SM(IPv6) Static RP-Set Information

Group Prefix  : ff00::/8
RP Address    : 2004::04
Override [No] : No

VRF: default

Status and Counters - PIM-SM(IPv6) Static RP-Set Information

Group Prefix  : ff00::/8
RP Address    : 2003::03
Override [No] : No
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim6 tree-state

```
show ipv6 pim6 tree-state {<group-ip> [<source-ip>]}|brief [{vrf <vrf-name>}| all-vrfs]
```

Description

Displays upstream join states for a specified group and source address in a VRF in an IPv6 network.

The command displays upstream state, upstream interface and RPF neighbor used to send join messages and a list of downstream interfaces from which join messages are received.

The set of downstream interfaces in this command may not show the final list of outgoing interfaces for a flow, which is computed from various internal states and is shown in the output of the command show ip mroute (PIM-SM.

Parameter	Description
`<group-ip>`	Shows PIM Join details for the specified group IPv6 address
`<source-ip>`	Shows PIM Join details for the specified source IPv6 address. If a source address is **not** specified, only *,G states are displayed for the specified group. If a source **address** is specified, (S,G) states are displayed along with (*,G) states and (S,G,RPT) states wherever applicable.
`brief`	Display brief details for the multicast group and source in a table format.
`vrf` *`<VRF-NAME>`*	Show join state details for the specified VRF.
`all-vrfs`	Show join state details for all VRFs.

Usage

The output of this command can indicate one of the following two multicast group (*,G) and multicast source and group (S,G) upstream states:

- **Joined** : Join sent to upstream RPF neighbor.
- **Not Joined** : Joins not sent upstream.

The following states are applicable to the multicast group (*G), and root path tree (S,G,RPT) only:

- **Pruned** : Traffic from the source is arriving on the shortest path tree, (*,G) Joined, but (S,G,RPT) pruned.
- **Not Pruned** : Traffic from the multicast group (*,G) Joined, and (S,G,rpt) not pruned.
- **RPT Not Joined**' : The multicast group (*,G) has not joined.

Examples

Display multicast group (*,G) join information for the VRF **red**.

```
show ipv6 pim6 tree-state ff55::1 vrf red
(*,G) Information for Group ff55::1
VRF: red
Upstream Information:
State                          : Joined
Joined Interface               : vlan50
RPF Neighbor                   : 20::2
Uptime                         : 01:58:30
Downstream Information:
Interfaces                     : vlan50, vlan201
```

Display group (*,G), source and group (S,G), and root-path tree (S,G, RPT) Information for group **ff55::1** and source IP **30::1**.

```
show ipv6 pim6 tree-state ff55::1 30::1 vrf red
(*,G) Information for Group ff55::1
VRF: red
```

```
Upstream Information:
State                         : Joined
Joined Interface              : vlan50
RPF Neighbor                  : 20::2
Uptime                        : 01:58:30
Downstream Information:
Interfaces                    : vlan200
(S,G) Information for Group ff55::1 Source 30::1
Upstream Information:
State                         : Joined
Joined Interface              : vlan30
RPF Neighbor                  : 40::2
Uptime                        : 01:57:30
SPT bit set                   : True
Downstream Information:
Interfaces                    : vlan200
(S,G,RPT) Information for Group ff55::1 Source 30::1
Upstream Information:
State                         : Pruned
Joined Interface              : vlan50
RPF Neighbor                  : 20::2
Uptime                        : 01:58:30
Downstream Information:
Interfaces                    : vlan200
```

Display brief information for the IPv6 PIM6 tree state.

```
show ipv6 pim6 tree-state brief
State abbreviations :
J - Joined  NJ - Not Joined  RPTNJ - RPT Not Joined
P - Pruned  NP - Not Pruned
---------------------------------------------------------------------------------
VRF : default
---------------------------------------------------------------------------------
Group Address      Source Address     RPF          Uptime        State  Type
Neighbor     (HH:MM:SS)
-------------      --------------     -----------  ----------    ------ -------
ff5e::1            *                  10::2        01:58:30      J      *,G
ff5e::1            2035:135:1::100    10::2        01:58:30      J      S,G
ff5e::2            *                  10::2        01:58:30      J      *,G
ff5e::2            2035:135:1::100    20::2        01:58:30      J      S,G
ff5e::2            2035:135:1::100    10::2        01:58:30      P      S,G,RPT
---------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.14	-Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

sources-per-group

```
sources-per-group <limit>
no sources-per-group <limit>
```

Description

Configures the total number of sources allowed for a group on the router. By default, there is no limit on the number of sources for a group. When the number of sources for a group exceeds the configured limit, multicast traffic from additional sources will be dropped.

The **no** form of this command removes the currently configured limit value.

Parameter	Description
<limit>	Specifies the value to be configured as the sources allowed per group. Range: 1 to 4294967295.

Usage

Flows exceeding the limit will be programmed as a bridge entry and will not have the outgoing interfaces list populated. This configuration does not allow new sources for the group. At the time of configuration, if the device has more sources for the given group than the configured value, already allowed sources continue to exist until they are removed.

The flows are programmed in the HW on a FCFS basis. There could be scenarios where the flow is forwarded in neighbor router, but it may not be forwarded on the current router because of exceeding the limits configured on the current router. In such cases, it is recommended to configure higher limits to avoid traffic outage.

Examples

Configuring and removing the sources allowed per group:

```
switch(config)# router pim6
switch(config-pim6)# sources-per-group 4
switch(config-pim6)# no sources-per-group
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced for IPv6

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

spt-threshold

```
spt-threshold
no spt-threshold
```

Description

Enables the router to switch the multicast traffic flows to the shortest path tree. Default is enabled.

The **no** form of this command disables the routers ability to switch the multicast traffic flows to the shortest path tree.

To apply this configuration a user needs to apply disable/enable PIM globally.

Example

Enabling and disabling the SPT threshold:

```
switch(config)# router pim6
switch(config-pim6)# spt-threshold
switch(config-pim6)# no spt-threshold
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

Chapter 107

PIM-SSM commands

ip igmp apply ssm-map access-list

```
ip igmp apply ssm-map access-list<ACL-NAME>
no ip igmp apply ssm-map access-list<ACL-NAME>
```

Description

Configures SSM-map ACL on a specific interface.

The **no** form of this command removes the currently configured ACL rule.

> Existing classifier commands are used to configure ACL.

Parameter	Description
<ACL-NAME>	Required. Specifies the ACL rule name.

Restrictions

- ACE using mask for source address will be ignored.
- ACE must include unicast source (address/source group) and multicast destination (address/destination group) as matching criteria. Entries using "any" for source address or destination address will be ignored.
- IGMPv3/MLDv2 dynamic joins will be ignored for groups in SSM-map (SSM-map is higher priority).

Usage

- When configured, every incoming IGMPv2/v1 join packet sent to the SSM range group address is converted to (S, G) channels where S is the source address specified in the SSM-map ACL.
- Object-groups can be used to group multiple sources or multiple destination addresses.

Recommendations related to SSM-map:

- Interfaces with SSM-map configured should use version 3 for IGMP and version 2 for MLD. If older versions are used, sources will not be learned.
- If SSM-map configuration is dynamically changed by adding or deleting sources associated with a group, the change will take effect when the next incoming join packet is received.
- SSM-map configuration must be consistent across all L3 nodes in the network.
- Multiple ACEs with same destination (address/destination object group) are not recommended as only the first match will be implemented. If a group must be mapped with multiple sources, source object group can be used instead of having multiple ACEs with the same destination match.

Examples

Creating SSM map ACL:

```
switch(config)# access-list ip SSM_MAP
switch(config-acl-ip)# permit ip 30.1.1.1 232.1.1.1
switch(config-acl-ip)# permit ip 20.1.1.1 232.1.1.2
```

Applying SSM_MAP ACL on a SVI:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ip igmp apply ssm-map access-list SSM_MAP
```

Creating SSM map ACL using object groups:

```
switch(config)# object-group ip address source-group
switch(config-addrgroup-ip)# 10.1.1.1
switch(config-addrgroup-ip)# 10.1.1.2
switch(config)# object-group ip address destination-group
switch(config-addrgroup-ip)# 232.2.1.1
switch(config-addrgroup-ip)# 232.3.1.1
switch(config)# access-list ip SSM_MAP_OB
switch(config-acl-ip)# permit ip source-group 232.1.1.3
switch(config-acl-ip)# permit ip 20.1.1.1 destination-group
```

In the above configuration:

- When lower version joins are received for group 232.1.1.3, they will be converted to (S,G) channels (10.1.1.1, 232.1.1.3) and (10.1.1.2, 232.1.1.3).
- When lower version joins are received from group 232.2.1.1 and 232.3.1.1, they will be converted to (S, G) channels (20.1.1.1, 232.2.1.1) and (20.1.1.1, 232.3.1.1)

Applying SSM_MAP_OB ACL on a SVI:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# ip igmp apply ssm-map access-list SSM_MAP_OB
```

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

show ip igmp ssm-map

```
show ip igmp [ssm-map [vrf <VRF-NAME> | all-vrfs]]
```

Description

Shows IGMP SSM map.

Parameter	Description
<VRF-NAME>	(Optional) Shows SSM map in a specific VRF.
all-vrfs	(Optional) Shows SSM map in all VRFs.

Examples

Showing IGMP SSM map:

```
switch# show ip igmp ssm-map
IGMP SSM-map Information
VRF Name   :default
Interface Name   SSM-map ACL name
--------------- -----------------
vlan10            ssm-map-1
vlan20            ssm-map-2
1/1/1             ssm-map-1
2/1/1.1           ssm-map-3
```

Showing IGMP SSM map for all VRFs:

```
switch# show ip igmp ssm-map all-vrfs
IGMP SSM-map Information
VRF Name   :test
Interface Name   SSM-map ACL name
--------------- -----------------
vlan30            ssm-map-1
VRF Name   :default
Interface Name   SSM-map ACL name
--------------- ------------------
vlan10            ssm-map-1
vlan20            ssm-map-2
1/1/1             ssm-map-1
2/1/1.1           ssm-map-3
```

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

Chapter 108

PIM-SSM commands for IPv4

pim-ssm

```
pim-ssm
no pim-ssm
```

Description

Enables PIM source-specific multicast globally on the router. When PIM SSM is enabled, the RP configuration is ignored/ not required for a particular range of multicast addresses.

The **no** form of this command disables PIM-SSM globally on the router.

When PIM-SSM is enabled for the SSM range for multicast groups, the following behavior is observed:

- PIM joins and prunes are directly sent towards the source. No (*,G) joins or prunes are sent towards RP.
- Only IGMPv3/MLDv2 joins with source include filter are considered for SSM.

Usage

- PIM-SSM is recommended to be configured only on the last hop router or receiver DR if the topology contains a combination of IGMPv2 and IGMPv3, or MLDv1 and MLDv2, clients.
- Configuring or unconfiguring PIM SSM can lead to momentary traffic loss until PIM rebuilds the states.
- PIM-SSM is not supported with VxLAN.

Example

Enabling PIM-SSM on the router:

```
switch(config)# router pim
switch(config-pim)# pim-ssm
```

Disabling PIM-SSM on the router:

```
switch(config)# router pim
switch(config-pim)# no pim-ssm
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

pim-ssm range-access-list

```
pim-ssm range-access-list <ACL-RULE>
no pim-ssm range-access-list <ACL-RULE>
```

Description

Enables the PIM router to modify the default SSM range. The IPv4 default PIM-SSM group range is 232.0.0.0/8.

The **no** form of this command removes the currently configured ACL rule.

Parameter	Description
<ACL-RULE>	(Required) Specifies the ACL rule name.

Usage

- In the ACL used to specify the PIM-SSM range, ACEs should contain only multicast group addresses in the destination IP field, else the ACE is ignored.
- Modifying the PIM-SSM range can lead to momentary traffic loss until PIM rebuilds the states.
- It is recommended to keep the SSM range the same across the network.

Examples

Creating an IPv4 ACL named **pim_ssm_grp_range_acl** and applying the ACL as a PIM-SSM range ACL:

```
switch# configure terminal
switch(config)# access-list ip pim_ssm_grp_range_acl
switch(config-acl-ip)# 10 permit any any 225.1.1.2/255.255.255.0
switch(config-acl-ip)# 20 permit any any 239.1.1.2/255.255.255.0

switch(config)# router pim
switch(config-pim)# pim-ssm range-access-list pim_ssm_grp_range_acl
switch(config-pim)# pim-ssm range-access-list pim_ssm_grp_range_acl_1
Failed to configure PIM-SSM Range ACL. ACL pim_ssm_grp_range_acl_1 does not exist.
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim`	Administrators or local user group members with execution rights for this command.

show ip mroute

`show ip mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows mroute information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing IP mroute for the default VRF:

```
Switch(config-vlan-20)# show ip mroute
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : 232.10.10.10
Source Address           : 192.168.20.2
SSM Mroute               : True
Neighbor                 : 192.168.3.0
Uptime                   : 02:08:31
State                    : route
Incoming interface       : 1/1/5
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding
```

Showing IP mroute for all VRFs:

```
switch# do show ip mroute all-vrfs
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : 232.10.10.10
Source Address           : 192.168.2.100
SSM Mroute               : True
Neighbor                 : 192.168.3.0
Uptime                   : 00:38:24
State                    : route
Incoming interface       : 1/1/4
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding

VRF : red
Total number of entries : 1

Group Address            : 232.11.11.11
Source Address           : 30.0.0.3
SSM Mroute               : True
Neighbor                 : 31.0.0.1
Uptime                   : 00:32:55
State                    : route
Incoming interface       : vlan31
Outgoing Interface List :
Interface       State
-----------     ----------
vlan32          forwarding

switch#
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip multicast summary

`show ip multicast summary`

Description

Displays multicast summary information.

Example

Showing multicast summary information:

```
Switch# show ip multicast summary

Total number of IGMP interfaces                               : 1
Total number of IGMP snooping VLANS                           : 0
Total number of IGMP joins                                    : 1
Total number of IGMP snooping joins                           : 0
Total number of PIM SM enabled VRFs                           : 1
Total number of PIM SSM enabled VRFs                          : 1
Total number of PIM DM enabled VRFs                           : 0
Total number of PIM SM interfaces                             : 2
Total number of PIM DM interfaces                             : 0
Total number of PIM SM neighbors                              : 1
Total number of PIM DM neighbors                              : 0
Total number of PIM A/A enabled VRF                           : 0
Total number of PIM A/A enabled interfaces                    : 0
Total number of PIM SM Mroutes in route state                 : 1
Total number of PIM SM Mroutes in bridge state                : 0
Total number of PIM SSM Mroutes in route state                : 1
Total number of PIM SSM Mroutes in bridge state               : 0
Total number of PIM DM Mroutes in route state                 : 0
Total number of PIM DM Mroutes in bridge state                : 0
Total number of local multicast flows registered in this RP   : 0
Total number of MLD interfaces                                : 1
Total number of MLD snooping VLANS                            : 1
Total number of MLD joins                                     : 1
Total number of MLD snooping joins                            : 1
Total number of PIMv6 SM enabled VRFs                         : 1
Total number of PIMv6 SSM enabled VRFs                        : 0
Total number of PIMv6 DM enabled VRFs                         : 0
Total number of PIMv6 SM interfaces                           : 2
Total number of PIMv6 DM interfaces                           : 0
Total number of PIMv6 SM neighbors                            : 1
Total number of PIMv6 DM neighbors                            : 0
Total number of PIMv6 A/A enabled VRF                         : 0
Total number of PIMv6 A/A enabled interfaces                  : 0
Total number of PIMv6 SM Mroutes in route state               : 1
Total number of PIMv6 SM Mroutes in bridge state              : 0
Total number of PIMv6 SSM Mroutes in route state              : 1
Total number of PIMv6 SSM Mroutes in bridge state             : 0
Total number of PIMv6 DM Mroutes in route state               : 0
Total number of PIMv6 DM Mroutes in bridge state              : 0
Total number of MSDP peers                                    : 0
Total number of SA's learned by MSDP                          : 0

VRF: default
Total number of IGMP interfaces                               : 1
Total number of IGMP snooping VLANS                           : 0
Total number of IGMP joins                                    : 1
Total number of IGMP snooping joins                           : 0
Total number of PIM SM interfaces                             : 2
Total number of PIM DM interfaces                             : 0
Total number of PIM SM neighbors                              : 1
Total number of PIM DM neighbors                              : 0
Total number of PIM A/A enabled interfaces                    : 0
Total number of PIM SM Mroutes in route state                 : 1
Total number of PIM SM Mroutes in bridge state                : 0
Total number of PIM SSM Mroutes in route state                : 1
Total number of PIM SSM Mroutes in bridge state                : 0
Total number of PIM DM Mroutes in route state                  : 0
Total number of PIM DM Mroutes in bridge state                 : 0
Total number of local multicast flows registered in this RP    : 0
Total number of MLD interfaces                                 : 1
Total number of MLD snooping VLANS                             : 1
Total number of MLD joins                                      : 1
Total number of MLD snooping joins                             : 1
Total number of PIMv6 SM interfaces                            : 2
Total number of PIMv6 DM interfaces                            : 0
Total number of PIMv6 SM neighbors                             : 1
Total number of PIMv6 DM neighbors                             : 0
Total number of PIMv6 A/A enabled interfaces                   : 0
Total number of PIMv6 SM Mroutes in route state                : 1
Total number of PIMv6 SM Mroutes in bridge state               : 0
Total number of PIMv6 SSM Mroutes in route state               : 1
Total number of PIMv6 SSM Mroutes in bridge state              : 0
Total number of PIMv6 DM Mroutes in route state                : 0
Total number of PIMv6 DM Mroutes in bridge state               : 0
Total number of MSDP peers                                     : 0
Total number of SA's learned by MSDP                           : 0

Switch#
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ip pim interface interface-name counters

`show ip pim interface <INTERFACE-NAME> counters [vsx-peer]`

Description

Shows the PIM packet counters information for the specified interface.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to show packet counter information.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not

Parameter	Description
	have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

Example

Showing PIM packet counters for interface 1/1/5:

```
Switch(config)# show ip pim interface 1/1/5 counters

Interface  : 1/1/5
VRF        : default

Tx Counters :

Hello                                    310
State Refresh                            0
Join/Prune                               141
SSM Join/Prune                           141
RP Advertisement                         0
Graft                                    0
Graft Ack                                0
Assert                                   0
Bsm                                      0
Register                                 0
Register Stop                            0
SSM Register Stop                        0

Rx Counters :

Hello                                    308
State Refresh                            0
Join/Prune                               0
SSM Join/Prune                           0
RP Advertisement                         0
Graft                                    0
Graft Ack                                0
Assert                                   0
Bsm                                      0
Register                                 0
SSM Register                             0
Register Stop                            0
Register Drops(Register ACL hitcount)    0
Join/Prune Drops(RP ACL hitcount)        0

Rx Drop Counters :

Hello                                    0
State Refresh                            0
Join/Prune                               0
RP Advertisement                         0
```

```
Graft                                    0
Graft Ack                                0
Assert                                   0
Bsm                                      0
Switch(config)#
```

Showing PIM packet counters for interface VLAN 1:

```
switch# show ip pim interface vlan1 counters

Interface           : vlan1
VRF                 : default

Rx Counters :

Hello                                  4
State Refresh                          0
Join/Prune                             1
RPadv                                  0
Graft                                  0
GraftAck                               0
Assert                                 0
Bsm                                    0
Register                               0
Register Stop                          0
Register Drops(Register ACL hitcount)  10
Join/Prune Drops(RP ACL hitcount)      5


Tx Counters :

Hello               9
State Refresh       0
Join/Prune          0
RPadv               0
Graft               0
GraftAck            0
Assert              0
Bsm                 0
Register            0
Register Stop       0

Invalid Rx Counters :

Hello               0
State Refresh       0
Join/Prune          0
RPadv               0
Graft               0
GraftAck            0
Assert              0
Bsm                 0
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 109

PIM-SSM commands for IPv6

ipv6 mld apply ssm-map access-list

```
ipv6 mld apply ssm-map access-list <ACL-NAME>
no ipv6 mld apply ssm-map access-list <ACL-NAME>
```

Description

Configures SSM-map ACL on a specific interface.

The **no** form of this command removes the currently configured ACL.

> Existing calssifier commands are used to configure ACL.

Parameter	Description
<ACL-NAME>	Required. Specifies the ACL name.

Restrictions

- ACE using mask for source address will be ignored.
- ACE must include unicast source (address/source group) and multicast destination (address/destination group) as matching criteria. Entries using "any" for source address or destination address will be ignored.
- IGMPv3/MLDv2 dynamic joins will be ignored for groups in SSM-map (SSM-map is higher priority).

Usage

- When configured, every incoming MLDv1 join packet sent to the same SSMv6 range group address is converted to (S, G) channels where S is the source address specified in the SSM-map ACL.
- Object-groups can be used to group multiple sources or multiple destination addresses.

Recommendations related to SSM-map:

- Interfaces with SSM-map configured should use version 3 for IGMP and version 2 for MLD. If older versions are used, sources will not be learned.
- If SSM-map configuration is dynamically changed by adding or deleting sources associated with a group, the change will take effect when the next incoming join packet is received.
- SSM-map configuration must be consistent across all L3 nodes in the network.
- Multiple ACEs with same destination (address/destination object group) are not recommended as only the first match will be implemented. If a group must be mapped with multiple sources, source object group can be used instead of having multiple ACEs with the same destination match.

Examples

Creating SSM map v6 ACL:

```
switch(config)# access-list ipv6 SSM_MAP_V6
switch(config-acl-ip)# permit ipv6 2003::1 ff34::1
switch(config-acl-ip)# permit ipv6 2002::1 ff36::1
switch(config-acl-ip)# exit
```

Applying SSM_MAP_V6 ACL on SVI 2:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# ipv6 mld apply ssm-map access-list SSM_MAP_V6
```

Creating SSM map V6 ACL with object groups:

```
switch(config)# object-group ipv6 address source-group-ipv6
switch(config-addrgroup-ipv6)# 2001::1
switch(config-addrgroup-ipv6)# 2001::2
switch(config)# object-group ipv6 address destination-group-ipv6
switch(config-addrgroup-ipv6)# ff31::1
switch((config-addrgroup-ipv6)# ff32::1
switch(config)# access-list ipv6 SSM_MAP_V6_OB
switch(config-acl-ip)# permit ipv6 source-group-ipv6 ff36::1
switch(config-acl-ip)# permit ipv6 2004::1 destination-group-ipv6
```

Applying SSM_MAP_V6_OB ACL on SVI 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# ipv6 mld apply ssm-map access-list SSM_MAP_V6_OB
```

In the above configuration:

- When lower version joins are received for group ff36::1, they will be converted to (S, G) channels (2001::1, ff36::1) and (2001::2, ff36::1).
- When lower version joins are received for group ff31::1 and ff32::1, they will be converted to (S, G) channels (2003::1, ff31::1) and (2003::1, ff32::1).

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-vlan`	Administrators or local user group members with execution rights for this command.

pim-ssm

```
pim-ssm
no pim-ssm
```

Description

Enables PIM-SSM globally on the router. When PIM-SSM is enabled, the RP configuration is ignored/ not required for a particular range of multicast addresses.

The **no** form of this command disables PIM-SSM globally on the router.

When PIM-SSM is enabled for the SSM range for multicast groups, the following behavior is observed:

- PIM joins and prunes are directly sent towards the source. No (*,G) joins or prunes are sent towards RP.
- Only IGMPv3/MLDv2 joins with source include filter are considered for SSM.

Usage

- PIM-SSM is recommended to be configured only on the last hop router or receiver DR if the topology contains a combination of IGMPv2 and IGMPv3, or MLDv1 and MLDv2, clients.
- Configuring or unconfiguring PIM SSM can lead to momentary traffic loss until PIM rebuilds the states.
- PIM-SSM is not supported with VxLAN.

Example

Entering the PIMv6 configuration context and enabling PIM-SSM on the router:

```
switch(config)# router pim6
switch(config-pim6)# pim-ssm
```

Disabling PIM-SSM on the router:

```
switch(config)# router pim6
switch(config-pim6)# no pim-ssm
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

pim-ssm range-access-list

```
pim-ssm range-access-list <ACL-RULE>
no pim-ssm range-access-list <ACL-RULE>
```

Description

Enables the PIM router to modify the default SSM range. The IPv6 default PIM-SSM group range is FF3x::/32.

The **no** form of this command removes the currently configured ACL rule.

Parameter	Description
<ACL-RULE>	Required. Specifies the ACL rule name.

Usage

- In the ACL used to specify the PIM-SSM range, ACEs should contain only multicast group addresses in the destination IP field, else the ACE will be ignored.
- Modifying the PIM-SSM range can lead to momentary traffic loss until PIM rebuilds the states.
- It is recommended to keep the SSM range the same across the network.

Examples

Creating an IPv6 ACL named **pim_ssm_v6grp_range_acl** with two entries and applying the ACL as a PIM-SSM range ACL:

```
switch# configure terminal
switch(config-pim)# access-list ipv6 pim_ssm_v6grp_range_acl
switch(config-acl-ipv6)# 10 permit any any ff2e::2/64
switch(config-acl-ipv6)# 20 permit any any ff1e::1/64

switch(config)# router pim6
switch(config-pim6)# pim-ssm range-access-list pim_ssm_v6grp_range_acl
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pim6`	Administrators or local user group members with execution rights for this command.

show ip multicast summary

```
show ip multicast summary
```

Description

Displays multicast summary information.

Example

Showing multicast summary information:

```
Switch# show ip multicast summary

Total number of IGMP interfaces                               : 1
Total number of IGMP snooping VLANS                           : 0
Total number of IGMP joins                                    : 1
Total number of IGMP snooping joins                           : 0
Total number of PIM SM enabled VRFs                           : 1
Total number of PIM SSM enabled VRFs                          : 1
Total number of PIM DM enabled VRFs                           : 0
Total number of PIM SM interfaces                             : 2
Total number of PIM DM interfaces                             : 0
Total number of PIM SM neighbors                              : 1
Total number of PIM DM neighbors                              : 0
Total number of PIM A/A enabled VRF                           : 0
Total number of PIM A/A enabled interfaces                    : 0
Total number of PIM SM Mroutes in route state                 : 1
Total number of PIM SM Mroutes in bridge state                : 0
Total number of PIM SSM Mroutes in route state                : 1
Total number of PIM SSM Mroutes in bridge state               : 0
Total number of PIM DM Mroutes in route state                 : 0
Total number of PIM DM Mroutes in bridge state                : 0
Total number of local multicast flows registered in this RP   : 0
Total number of MLD interfaces                                : 1
Total number of MLD snooping VLANS                            : 1
Total number of MLD joins                                     : 1
Total number of MLD snooping joins                            : 1
Total number of PIMv6 SM enabled VRFs                         : 1
Total number of PIMv6 SSM enabled VRFs                        : 0
Total number of PIMv6 DM enabled VRFs                         : 0
Total number of PIMv6 SM interfaces                           : 2
Total number of PIMv6 DM interfaces                           : 0
Total number of PIMv6 SM neighbors                            : 1
Total number of PIMv6 DM neighbors                            : 0
Total number of PIMv6 A/A enabled VRF                         : 0
Total number of PIMv6 A/A enabled interfaces                  : 0
Total number of PIMv6 SM Mroutes in route state               : 1
Total number of PIMv6 SM Mroutes in bridge state              : 0
Total number of PIMv6 SSM Mroutes in route state              : 1
Total number of PIMv6 SSM Mroutes in bridge state             : 0
Total number of PIMv6 DM Mroutes in route state               : 0
Total number of PIMv6 DM Mroutes in bridge state              : 0
Total number of MSDP peers                                    : 0
Total number of SA's learned by MSDP                          : 0

VRF: default
Total number of IGMP interfaces                               : 1
Total number of IGMP snooping VLANS                           : 0
Total number of IGMP joins                                    : 1
Total number of IGMP snooping joins                           : 0
Total number of PIM SM interfaces                             : 2
Total number of PIM DM interfaces                             : 0
Total number of PIM SM neighbors                              : 1
Total number of PIM DM neighbors                              : 0
Total number of PIM A/A enabled interfaces                      : 0
Total number of PIM SM Mroutes in route state                   : 1
Total number of PIM SM Mroutes in bridge state                  : 0
Total number of PIM SSM Mroutes in route state                  : 1
Total number of PIM SSM Mroutes in bridge state                 : 0
Total number of PIM DM Mroutes in route state                   : 0
Total number of PIM DM Mroutes in bridge state                  : 0
Total number of local multicast flows registered in this RP     : 0
Total number of MLD interfaces                                  : 1
Total number of MLD snooping VLANS                              : 1
Total number of MLD joins                                       : 1
Total number of MLD snooping joins                              : 1
Total number of PIMv6 SM interfaces                             : 2
Total number of PIMv6 DM interfaces                             : 0
Total number of PIMv6 SM neighbors                              : 1
Total number of PIMv6 DM neighbors                              : 0
Total number of PIMv6 A/A enabled interfaces                    : 0
Total number of PIMv6 SM Mroutes in route state                 : 1
Total number of PIMv6 SM Mroutes in bridge state                : 0
Total number of PIMv6 SSM Mroutes in route state                : 1
Total number of PIMv6 SSM Mroutes in bridge state               : 0
Total number of PIMv6 DM Mroutes in route state                 : 0
Total number of PIMv6 DM Mroutes in bridge state                : 0
Total number of MSDP peers                                      : 0
Total number of SA's learned by MSDP                            : 0

Switch#
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 pim interface counters

```
show ipv6 pim interface <INTERFACE-NAME> counters [vsx-peer]
```

Description

Shows the PIM packet counters information for the specified interface.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface to show packet counter information.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Loopback interfaces are special interfaces where only unicast PIM messages are updated. This includes Register, Register Stop, and Candidate RP Advertisements.

When a loopback interface is configured as the RP, the ACL drop counters will be updated on the interface on which the packets are received.

Example

Showing IPv6 PIM packet counters:

```
Switch#
Switch# show ipv6 pim interface 1/1/5 counters

Interface  : 1/1/5
VRF        : default

Tx Counters :

Hello                                     275
State Refresh                             0
Join/Prune                                32
SSM Join/Prune                            32
RP Advertisement                          0
Graft                                     0
Graft Ack                                 0
Assert                                    0
Bsm                                       0
Register                                  0
Register Stop                             0
SSM Register Stop                         0

Rx Counters :

Hello                                     272
State Refresh                             0
Join/Prune                                0
SSM Join/Prune                            0
RP Advertisement                          0
Graft                                     0
Graft Ack                                 0
Assert                                    0
Bsm                                       0
Register                                  0
SSM Register                              0
Register Stop                             0
Register Drops(Register ACL hitcount)     0
Join/Prune Drops(RP ACL hitcount)         0

Rx Drop Counters :
```

```
Hello                                    0
State Refresh                            0
Join/Prune                               0
RP Advertisement                         0
Graft                                    0
Graft Ack                                0
Assert                                   0
Bsm                                      0
Switch#
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show ipv6 mld ssm-map

`show ipv6 mld [ssm-map [vrf <VRF-NAME> | all-vrfs]]`

Description

Shows MLD SSM map.

Parameter	Description
<VRF-NAME>	Optional. Shows MLD SSM map in a specific VRF.
all-vrfs	Optional. Shows MLD SSM map in all VRFs.

Examples

Showing MLD SSM-map:

```
switch# show ipv6 mld ssm-map
MLD SSM-map Information
VRF Name   :default
Interface Name   SSM map ACL name
--------------- ------------------
```

```
vlan10           ipv6-ssm-map-1
vlan20           ipv6-ssm-map-2
1/1/1            ipv6-ssm-map-3
2/1/1.1          ipv6-ssm-map-1
```

Showing MLD SSM-map for all VRFs:

```
switch# show ipv6 mld ssm-map all-vrfs
MLD SSM-map Information
VRF Name   :test
Interface Name   SSM map ACL name
--------------- ------------------
vlan30           ipv6-ssm-map-1
VRF Name   :default
Interface Name   SSM map ACL name
--------------- ------------------
vlan10           ipv6-ssm-map-1
vlan20           ipv6-ssm-map-2
1/1/1            ipv6-ssm-map-3
2/1/1.1          ipv6-ssm-map-1
```

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show ipv6 mroute

`show ipv6 mroute [all-vrfs | vrf <VRF-NAME>] [vsx-peer]`

Description

Shows multicast routing information. Optionally, you can show specific information by VRF. If no options are specified, it shows information for the default VRF.

Parameter	Description
`all-vrfs`	Shows information for all VRFs.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing IPv6 mroute information for the default VRF:

```
Switch# show ipv6 mroute
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : ff32::10
Source Address           : fd00:192:168:20::2
SSM Mroute               : True
Neighbor                 : fe80::f403:4301:1422:2600
Uptime                   : 00:14:05
State                    : route
Incoming interface       : 1/1/5
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding
```

Showing IPv6 mroute information for all VRFs:

```
switch# do show ipv6 mroute all-vrfs
IP Multicast Route Entries

VRF : default
Total number of entries : 1

Group Address            : ff32::10
Source Address           : fd00:192:168:2::100
SSM Mroute               : True
Neighbor                 : fe80::eceb:b801:14e4:2900
Uptime                   : 00:19:20
State                    : route
Incoming interface       : 1/1/4
Outgoing Interface List :
Interface       State
-----------     ----------
vlan20          forwarding

VRF : red
Total number of entries : 1

Group Address            : ff32::11
Source Address           : 30::3
SSM Mroute               : True
Neighbor                 : fe80::eceb:b880:1fe4:2900
Uptime                   : 00:01:13
State                    : route
Incoming interface       : vlan31
Outgoing Interface List :
Interface       State
-----------     ----------
vlan32          forwarding
```

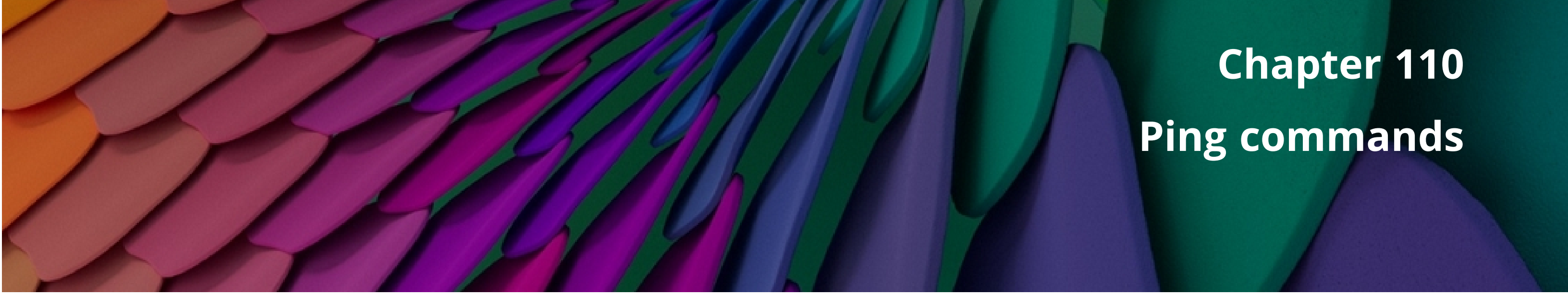
For more information on features that use this command, refer to the Multicast Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 110 Ping commands

ping

```
ping <IPv4-ADDR> | <hostname> [data-fill <pattern> | datagram-size <size> |
   interval <time> | repetitions <number> | timeout <time> | tos <number> |
   ip-option {include-timestamp | include-timestamp-and-address | record-route} |
   vrf <vrfname> | do-not-fragment][source {IPv4-ADDR | IFNAME}]
```

> Ping on VXLAN with `ip-option` such as `include-timestamp-and-address`, `include-timestamp` and `record-route` is not supported.

Description

Pings the specified IPv4 address or hostname with or without optional parameters.

Parameter	Description
`ping <IPv4-ADDR>`	Selects the IPv4 address to ping.
`<HOSTNAME>`	Selects the hostname to ping. Range: 1-256 characters
`data-fill <PATTERN>`	Specifies the data pattern in hexadecimal digits to send. A maximum of 16 "pad" bytes can be specified to fill out the ICMP packet. Default: AB
`datagram-size <SIZE>`	Specifies the ping datagram size. Range: 0-65399, default: 100.
`interval <TIME>`	Specifies the interval between successive ping requests in seconds. Range: 1-60 seconds, default: 1 second.
`repetitions <NUMBER>`	Specifies the number of packets to send. Range: 1-10000 packets, default: Five packets.
`timeout <TIME>`	Specifies the ping timeout in seconds. Range: 1-60 seconds, default: 2 seconds.
`tos <NUMBER>`	Specifies the IP Type of Service to be used in Ping request. Range: 0-255
`ip-option {include-timestamp	include-timestamp-and-address	record-route}`	Specifies an IP option (**record-route** or **timestamp** option).
`include-timestamp`	Specifies the intermediate router time stamp.
`include-timestamp-and-address`	Specifies the intermediate router time stamp and IP address.
`record-route`	Specifies the intermediate router addresses.

Parameter	Description
`vrf` *`<VRF-NAME>`*	Specifies the virtual routing and forwarding (VRF) to use. When VRF option is not given, the default VRF is used.
`source {`*`IPv4-ADDR`*` | `*`IFNAME`*`}`	Specifies the source IPv4 address or interface to use.
`do-not-fragment`	Specifies the do-not-fragment (DF) bit in IP header of the Ping packet. This option does not allow the packet to be fragmented when it has to go through a segment with a smaller maximum transmission unit (MTU).

Examples

Pinging an IPv4 address:

```
switch# ping 10.0.0.0
PING 10.0.0.0 (10.0.0.0) 100(128) bytes of data.
108 bytes from 10.0.0.0: icmp_seq=1 ttl=64 time=0.035 ms
108 bytes from 10.0.0.0: icmp_seq=2 ttl=64 time=0.034 ms
108 bytes from 10.0.0.0: icmp_seq=3 ttl=64 time=0.034 ms
108 bytes from 10.0.0.0: icmp_seq=4 ttl=64 time=0.034 ms
108 bytes from 10.0.0.0: icmp_seq=5 ttl=64 time=0.033 ms

--- 10.0.0.0 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.033/0.034/0.035/0.000 ms
```

Pinging the localhost:

```
switch# ping localhost
PING localhost (127.0.0.1) 100(128) bytes of data.
108 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.060 ms
108 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.035 ms
108 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.043 ms
108 bytes from localhost (127.0.0.1): icmp_seq=4 ttl=64 time=0.041 ms
108 bytes from localhost (127.0.0.1): icmp_seq=5 ttl=64 time=0.034 ms

--- localhost ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3998ms
rtt min/avg/max/mdev = 0.034/0.042/0.060/0.011 ms
```

Pinging a server with a data pattern:

```
switch# ping 10.0.0.2 data-fill 1234123412341234acde123456789012
PATTERN: 0x1234123412341234acde123456789012
PING 10.0.0.2 (10.0.0.2) 100(128) bytes of data.
108 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=0.207 ms
108 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.187 ms
108 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.225 ms
108 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=0.197 ms
108 bytes from 10.0.0.2: icmp_seq=5 ttl=64 time=0.210 ms

--- 10.0.0.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.187/0.205/0.225/0.015 ms
```

Pinging a server with a datagram size:

```
switch# ping 10.0.0.0 datagram-size 200
PING 10.0.0.0 (10.0.0.0) 200(228) bytes of data.
208 bytes from 10.0.0.0: icmp_seq=1 ttl=64 time=0.202 ms
208 bytes from 10.0.0.0: icmp_seq=2 ttl=64 time=0.194 ms
208 bytes from 10.0.0.0: icmp_seq=3 ttl=64 time=0.201 ms
208 bytes from 10.0.0.0: icmp_seq=4 ttl=64 time=0.200 ms
208 bytes from 10.0.0.0: icmp_seq=5 ttl=64 time=0.186 ms

--- 10.0.0.0 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
rtt min/avg/max/mdev = 0.186/0.196/0.202/0.016 ms
```

Pinging a server with an interval specified:

```
switch# ping 9.0.0.2 interval 2
PING 9.0.0.2 (9.0.0.2) 100(128) bytes of data.
108 bytes from 9.0.0.2: icmp_seq=1 ttl=64 time=0.199 ms
108 bytes from 9.0.0.2: icmp_seq=2 ttl=64 time=0.192 ms
108 bytes from 9.0.0.2: icmp_seq=3 ttl=64 time=0.208 ms
108 bytes from 9.0.0.2: icmp_seq=4 ttl=64 time=0.182 ms
108 bytes from 9.0.0.2: icmp_seq=5 ttl=64 time=0.194 ms

--- 9.0.0.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 7999ms
rtt min/avg/max/mdev = 0.182/0.195/0.208/0.008 ms
```

Pinging a server with a specified number of packets to send:

```
switch# ping 9.0.0.2 repetitions 10
PING 9.0.0.2 (9.0.0.2) 100(128) bytes of data.
108 bytes from 9.0.0.2: icmp_seq=1 ttl=64 time=0.213 ms
108 bytes from 9.0.0.2: icmp_seq=2 ttl=64 time=0.204 ms
108 bytes from 9.0.0.2: icmp_seq=3 ttl=64 time=0.201 ms
108 bytes from 9.0.0.2: icmp_seq=4 ttl=64 time=0.184 ms
108 bytes from 9.0.0.2: icmp_seq=5 ttl=64 time=0.202 ms
108 bytes from 9.0.0.2: icmp_seq=6 ttl=64 time=0.184 ms
108 bytes from 9.0.0.2: icmp_seq=7 ttl=64 time=0.193 ms
108 bytes from 9.0.0.2: icmp_seq=8 ttl=64 time=0.196 ms
108 bytes from 9.0.0.2: icmp_seq=9 ttl=64 time=0.193 ms
108 bytes from 9.0.0.2: icmp_seq=10 ttl=64 time=0.200 ms

--- 9.0.0.2 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 8999ms
rtt min/avg/max/mdev = 0.184/0.197/0.213/0.008 ms
```

Pinging a server with a specified timeout:

```
switch# ping 9.0.0.2 timeout 3
PING 9.0.0.2 (9.0.0.2) 100(128) bytes of data.
108 bytes from 9.0.0.2: icmp_seq=1 ttl=64 time=0.175 ms
108 bytes from 9.0.0.2: icmp_seq=2 ttl=64 time=0.192 ms
108 bytes from 9.0.0.2: icmp_seq=3 ttl=64 time=0.190 ms
108 bytes from 9.0.0.2: icmp_seq=4 ttl=64 time=0.181 ms
108 bytes from 9.0.0.2: icmp_seq=5 ttl=64 time=0.197 ms

--- 9.0.0.2 ping statistics ---
```

```
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
rtt min/avg/max/mdev = 0.175/0.187/0.197/0.007 ms
```

Pinging a server with the specified IP Type of Service:

```
switch# ping 9.0.0.2 tos 2
PING 9.0.0.2 (9.0.0.2) 100(128) bytes of data.
108 bytes from 9.0.0.2: icmp_seq=1 ttl=64 time=0.033 ms
108 bytes from 9.0.0.2: icmp_seq=2 ttl=64 time=0.034 ms
108 bytes from 9.0.0.2: icmp_seq=3 ttl=64 time=0.031 ms
108 bytes from 9.0.0.2: icmp_seq=4 ttl=64 time=0.034 ms
108 bytes from 9.0.0.2: icmp_seq=5 ttl=64 time=0.031 ms

--- 9.0.0.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.031/0.032/0.034/0.006 ms
```

Pinging a local host with the specified VRF.

```
switch# ping localhost vrf red
PING localhost (127.0.0.1) 100(128) bytes of data.
108 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.048 ms
108 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.052 ms
108 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.044 ms
108 bytes from localhost (127.0.0.1): icmp_seq=4 ttl=64 time=0.036 ms
108 bytes from localhost (127.0.0.1): icmp_seq=5 ttl=64 time=0.055 ms

--- localhost ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 0.036/0.047/0.055/0.006 ms
```

Pinging the localhost with the default VRF:

```
switch# ping localhost vrf mgmt
PING localhost (127.0.0.1) 100(128) bytes of data.
108 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.085 ms
108 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.057 ms
108 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.047 ms
108 bytes from localhost (127.0.0.1): icmp_seq=4 ttl=64 time=0.038 ms
108 bytes from localhost (127.0.0.1): icmp_seq=5 ttl=64 time=0.059 ms

--- localhost ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.038/0.057/0.085/0.016 ms
```

Pinging a server with the intermediate router time stamp:

```
switch# ping 9.0.0.2 ip-option include-timestamp
PING 9.0.0.2 (9.0.0.2) 100(168) bytes of data.
108 bytes from 9.0.0.2: icmp_seq=1 ttl=64 time=0.031 ms
TS:     59909005 absolute
        0
        0
        0

108 bytes from 9.0.0.2: icmp_seq=2 ttl=64 time=0.034 ms
```

```
TS:     59910005 absolute
        0
        0
        0

108 bytes from 9.0.0.2: icmp_seq=3 ttl=64 time=0.038 ms
TS:     59911005 absolute
        0
        0
        0

108 bytes from 9.0.0.2: icmp_seq=4 ttl=64 time=0.035 ms
TS:     59912005 absolute
        0
        0
        0

108 bytes from 9.0.0.2: icmp_seq=5 ttl=64 time=0.037 ms
TS:     59913005 absolute
        0
        0
        0


--- 9.0.0.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.031/0.035/0.038/0.002 ms
```

Pinging a server with the intermediate router time stamp and address:

```
switch# ping 9.0.0.2 ip-option include-timestamp-and-address
PING 9.0.0.2 (9.0.0.2) 100(168) bytes of data.
108 bytes from 9.0.0.2: icmp_seq=1 ttl=64 time=0.030 ms
TS:     9.0.0.2 60007355 absolute
        9.0.0.2 0
        9.0.0.2 0
        9.0.0.2 0

108 bytes from 9.0.0.2: icmp_seq=2 ttl=64 time=0.037 ms
TS:     9.0.0.2 60008355 absolute
        9.0.0.2 0
        9.0.0.2 0
        9.0.0.2 0

108 bytes from 9.0.0.2: icmp_seq=3 ttl=64 time=0.037 ms
TS:     9.0.0.2 60009355 absolute
        9.0.0.2 0
        9.0.0.2 0
        9.0.0.2 0

108 bytes from 9.0.0.2: icmp_seq=4 ttl=64 time=0.038 ms
TS:     9.0.0.2 60010355 absolute
        9.0.0.2 0
        9.0.0.2 0
        9.0.0.2 0

108 bytes from 9.0.0.2: icmp_seq=5 ttl=64 time=0.039 ms
TS:     9.0.0.2 60011355 absolute
        9.0.0.2 0
        9.0.0.2 0
        9.0.0.2 0
```

```
--- 9.0.0.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.030/0.036/0.039/0.005 ms
```

Pinging a server with the intermediate router address:

```
switch# ping 9.0.0.2 ip-option record-route
PING 9.0.0.2 (9.0.0.2) 100(168) bytes of data.
108 bytes from 9.0.0.2: icmp_seq=1 ttl=64 time=0.034 ms
RR:     9.0.0.2
        9.0.0.2
        9.0.0.2
        9.0.0.2

108 bytes from 9.0.0.2: icmp_seq=2 ttl=64 time=0.038 ms (same route)
108 bytes from 9.0.0.2: icmp_seq=3 ttl=64 time=0.036 ms (same route)
108 bytes from 9.0.0.2: icmp_seq=4 ttl=64 time=0.037 ms (same route)
108 bytes from 9.0.0.2: icmp_seq=5 ttl=64 time=0.035 ms (same route)

--- 9.0.0.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.034/0.036/0.038/0.001 ms
```

Pinging a server with do-not-fragment:

```
switch# ping 192.168.1.8 datagram-size 2000 do-not-fragment
PING 192.168.1.8 (192.168.1.8) 2000(2028) bytes of data.
2008 bytes from 192.168.1.8: icmp_seq=1 ttl=64 time=0.721 ms
2008 bytes from 192.168.1.8: icmp_seq=2 ttl=64 time=0.792 ms
2008 bytes from 192.168.1.8: icmp_seq=3 ttl=64 time=0.857 ms
2008 bytes from 192.168.1.8: icmp_seq=4 ttl=64 time=0.833 ms
2008 bytes from 192.168.1.8: icmp_seq=5 ttl=64 time=0.836 ms

--- 192.168.1.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4056ms
rtt min/avg/max/mdev = 0.721/0.807/0.857/0.048 ms
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager	Operators or Administrators or local user group members with

Platforms	Command context	Authority
	(#)	execution rights for this command. Operators can execute this command from the operator context (>) only.

ping6

```
ping6 {<IPv6-ADDR> | <HOSTNAME>} [data-fill <PATTERN> | datagram-size <SIZE> |
   interval <TIME> | repetitions <NUMBER> | timeout <TIME> | vrrp <VRID> |
   vrf <VRF-NAME> | source <IPv6-ADDR> | <IFNAME>]
```

Description

Pings the specified IPv6 address or hostname with or without optional parameters. The VRRP option is provided to self-ping the configured link-local address on the VRRP group.

Parameter	Description
`IPv6-ADDR`	Selects the IPv6 address to ping.
`HOSTNAME`	Selects the hostname to ping. Range: 1-256 characters
`data-fill <PATTERN>`	Specifies the data pattern in hexadecimal digits to send. A maximum of 16 "pad" bytes can be specified to fill out the ICMP packet. Default: AB
`datagram-size <SIZE>`	Specifies the ping datagram size. Range: 0-65399, default: 100.
`interval <TIME>`	Specifies the interval between successive ping requests in seconds. Range: 1-60 seconds, default: 1 second.
`repetitions <NUMBER>`	Specifies the number of packets to send. Range: 1-10000 packets, default: Five packets.
`timeout <TIME>`	Specifies the ping timeout in seconds. Range: 1-60 seconds, default: 2 seconds.
`vrrp <VRID>`	Specifies the VRRP group ID.
`vrf <VRF-NAME>`	Specifies the virtual routing and forwarding (VRF) to use. When this option is not provided, the default VRF is used.
`source <IPv6-ADDR> | <IFNAME>`	Specifies the source IPv6 address or interface to use.

Examples

Pinging an IPv6 address:

```
switch# ping6 2020::2
PING 2020::2(2020::2) 100 data bytes
108 bytes from 2020::2: icmp_seq=1 ttl=64 time=0.386 ms
108 bytes from 2020::2: icmp_seq=2 ttl=64 time=0.235 ms
108 bytes from 2020::2: icmp_seq=3 ttl=64 time=0.249 ms
108 bytes from 2020::2: icmp_seq=4 ttl=64 time=0.240 ms
108 bytes from 2020::2: icmp_seq=5 ttl=64 time=0.252 ms

--- 2020::2 ping statistics ---
```

```
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
rtt min/avg/max/mdev = 0.235/0.272/0.386/0.059 ms
```

Pinging the localhost:

```
switch# ping6 localhost
PING localhost(localhost) 100 data bytes
108 bytes from localhost: icmp_seq=1 ttl=64 time=0.093 ms
108 bytes from localhost: icmp_seq=2 ttl=64 time=0.051 ms
108 bytes from localhost: icmp_seq=3 ttl=64 time=0.055 ms
108 bytes from localhost: icmp_seq=4 ttl=64 time=0.046 ms
108 bytes from localhost: icmp_seq=5 ttl=64 time=0.048 ms

--- localhost ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3998ms
rtt min/avg/max/mdev = 0.046/0.058/0.093/0.019 ms
```

Pinging a server with a data pattern:

```
switch# ping6 2020::2 data-fill ab
PATTERN: 0xab
PING 2020::2(2020::2) 100 data bytes
108 bytes from 2020::2: icmp_seq=1 ttl=64 time=0.038 ms
108 bytes from 2020::2: icmp_seq=2 ttl=64 time=0.074 ms
108 bytes from 2020::2: icmp_seq=3 ttl=64 time=0.076 ms
108 bytes from 2020::2: icmp_seq=4 ttl=64 time=0.075 ms
108 bytes from 2020::2: icmp_seq=5 ttl=64 time=0.077 ms

--- 2020::2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.038/0.068/0.077/0.015 ms
```

Pinging a server with a datagram size:

```
switch# ping6 2020::2 datagram-size 200
PING 2020::2(2020::2) 200 data bytes
208 bytes from 2020::2: icmp_seq=1 ttl=64 time=0.037 ms
208 bytes from 2020::2: icmp_seq=2 ttl=64 time=0.076 ms
208 bytes from 2020::2: icmp_seq=3 ttl=64 time=0.076 ms
208 bytes from 2020::2: icmp_seq=4 ttl=64 time=0.077 ms
208 bytes from 2020::2: icmp_seq=5 ttl=64 time=0.066 ms

--- 2020::2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.037/0.066/0.077/0.016 ms
```

Pinging a server with an interval specified:

```
switch# ping6 2020::2 interval 5
PING 2020::2(2020::2) 100 data bytes
108 bytes from 2020::2: icmp_seq=1 ttl=64 time=0.043 ms
108 bytes from 2020::2: icmp_seq=2 ttl=64 time=0.075 ms
108 bytes from 2020::2: icmp_seq=3 ttl=64 time=0.074 ms
108 bytes from 2020::2: icmp_seq=4 ttl=64 time=0.075 ms
108 bytes from 2020::2: icmp_seq=5 ttl=64 time=0.075 ms
```

```
--- 2020::2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 19999ms
rtt min/avg/max/mdev = 0.043/0.068/0.075/0.014 ms
```

Pinging a server with a specified number of packets to send:

```
switch# ping6 2020::2 repetitions 6
PING 2020::2(2020::2) 100 data bytes
108 bytes from 2020::2: icmp_seq=1 ttl=64 time=0.039 ms
108 bytes from 2020::2: icmp_seq=2 ttl=64 time=0.070 ms
108 bytes from 2020::2: icmp_seq=3 ttl=64 time=0.076 ms
108 bytes from 2020::2: icmp_seq=4 ttl=64 time=0.076 ms
108 bytes from 2020::2: icmp_seq=5 ttl=64 time=0.071 ms
108 bytes from 2020::2: icmp_seq=6 ttl=64 time=0.078 ms

--- 2020::2 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 4999ms
rtt min/avg/max/mdev = 0.039/0.068/0.078/0.015 ms
```

Pinging a local host with the specified VRF.

```
switch# ping6 localhost vrf red
PING localhost(localhost) 100 data bytes
108 bytes from localhost: icmp_seq=1 ttl=64 time=0.038 ms
108 bytes from localhost: icmp_seq=2 ttl=64 time=0.050 ms
108 bytes from localhost: icmp_seq=3 ttl=64 time=0.039 ms
108 bytes from localhost: icmp_seq=4 ttl=64 time=0.040 ms
108 bytes from localhost: icmp_seq=5 ttl=64 time=0.027 ms

--- localhost ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4001ms
rtt min/avg/max/mdev = 0.027/0.038/0.050/0.010 ms
```

Pinging the localhost with the default VRF:

```
switch# ping6 localhost vrf mgmt
PING localhost(localhost) 100 data bytes
108 bytes from localhost: icmp_seq=1 ttl=64 time=0.032 ms
108 bytes from localhost: icmp_seq=2 ttl=64 time=0.022 ms
108 bytes from localhost: icmp_seq=3 ttl=64 time=0.040 ms
108 bytes from localhost: icmp_seq=4 ttl=64 time=0.022 ms
108 bytes from localhost: icmp_seq=5 ttl=64 time=0.046 ms

--- localhost ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3998ms
rtt min/avg/max/mdev = 0.022/0.032/0.046/0.010 ms
```

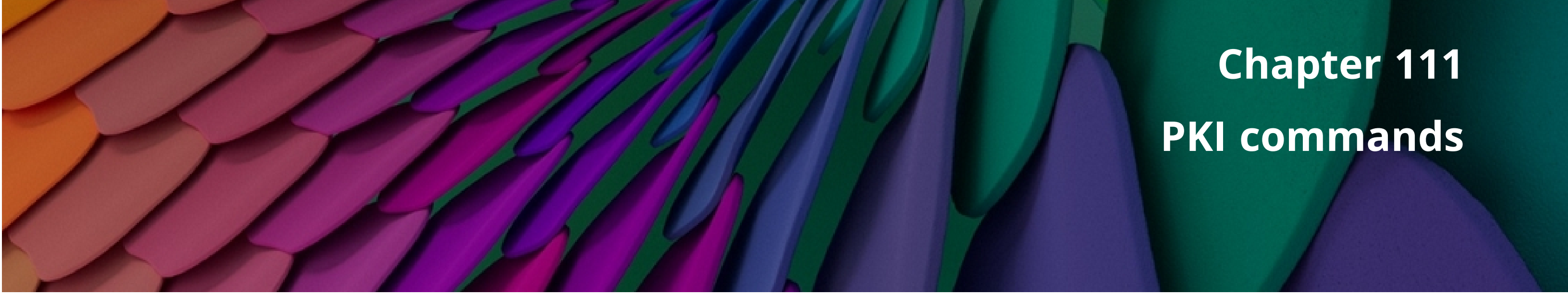
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 111
PKI commands

crypto pki application

```
crypto pki application <APP-NAME> certificate <CERT-NAME>
no crypto pki application <APP-NAME> certificate <CERT-NAME>
```

Description

Associates a leaf certificate with a feature (application) on the switch. By default, all features are associated with the default, self-signed certificate **local-cert**. This certificate is created by the switch the first time it starts.

The **no** form of this command associates the specified feature with the default certificate.

Parameter	Description
<APP-NAME>	Specifies the name of a feature on the switch: ■ **captive-portal**: Captive portal ■ **dot1x-supplicant**: 802.1X supplicant ■ **est-client**: EST client ■ **hsc**: Hardware switch controller ■ **https-server**: HTTPS server ■ **radsec-client**: RadSec client ■ **syslog-client**: Syslog client **syslog-client** communicates with syslog server over TLS. You can associate a certificate with the **syslog-client** application by enrolling the certificate manually or through EST.
<CERT-NAME>	Specifies the name of an installed leaf certificate.

Examples

Associating the EST client with leaf certificate **leaf-cert1**:

```
switch(config)# crypto pki application est-client certificate leaf-cert1
```

Associating the syslog client with leaf certificate **leaf-cert**:

```
switch(config)# crypto pki application syslog-client certificate leaf-cert
```

Setting the syslog client to use the default certificate:

```
switch(config)# no crypto pki application syslog-client certificate
```

Setting the RadSec client to use the default certificate:

```
switch(config)# no crypto pki application radsec-client certificate
```

Associating the RadSec client with leaf certificate **leaf-cert**:

```
switch(config)# crypto pki application radsec-client certificate leaf-cert
```

Associating the HTTPS server with leaf certificate **leaf-cert2**:

```
switch(config)# crypto pki application https-server certificate leaf-cert2
```

Associating the 802.1X supplicant with leaf certificate **cert1**:

```
switch(config)# crypto pki application dot1x-supplicant certificate cert1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

crypto pki certificate

```
crypto pki certificate <CERT-NAME>
no crypto pki certificate <CERT-NAME>
```

Description

Creates a leaf certificate and changes to its context **config-cert-<CERT-NAME>**. If the specified leaf certificate exists, this command changes to its context.

The first time the switch starts it creates a self-signed, default leaf certificate called **local-cert**. This certificate is used by any switch application that does not have an associated leaf certificate.

The **no** form of this command deletes the specified leaf certificate. The default leaf certificate **local-cert** cannot be deleted.

Parameter	Description
<CERT-NAME>	Specifies the name of a leaf certificate. Range: 1 to 32 alphanumeric characters (excluding ").

Examples

Creating leaf certificate **leaf-cert**:

```
switch(config)# crypto pki certificate leaf-cert
switch(config-cert-leaf-cert)#
```

Deleting leaf certificate **leaf-cert**:

```
switch(config)# no crypto pki certificate leaf-cert
The leaf certificate has associated applications. Deleting the certificate
will make the applications use the default certificate local-cert.
Continue (y/n)? y
switch(config)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

crypto pki ta-profile

```
crypto pki ta-profile <TA-NAME>
no crypto pki ta-profile <TA-NAME>
```

Description

Creates a trust anchor (TA) profile and changes to the **config-ta-<TA-NAME>** context for the profile. Each TA profile stores the certificate for a trusted CA. Up to 64 profiles can be defined.

If the specified TA profile exists, this command changes to the **config-ta-<TA-NAME>** context for the profile.

The **no** form of this command removes the specified TA profile.

When creating a new profile, If you exit the **config-ta-<TA-NAME>** context without importing the TA certificate, the profile is discarded.

Parameter	Description
<TA-NAME>	Specifies the TA profile name. Range: 1 to 48 alphanumeric characters excluding ". **NOTE:** The TA profile name cannot end with **est-ta<nn>** where **<nn>** is **00** to **99**. For example, **company-trust-anchor-est-ta01** is not allowed. This TA profile name suffix is reserved for TA profiles that are created for CA certificates from EST servers.

Examples

Creating the TA profile **root-cert**:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)#
```

Removing TA profile **root-cert**:

```
switch(config)# no crypto pki ta-profile root-cert
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

enroll self-signed

```
enroll self-signed
```

Description

Generates a key pair and generates a self-signed certificate with it.

The subject fields and key type of the current leaf certificate must be defined before running this command. If not, you are prompted to fill in the subject fields, and the key type is set to **RSA 2048**.

Example

Enrolling the leaf certificate **leaf-cert**:

```
switch(config-cert-leaf-cert)# enroll self-signed
You are enrolling a certificate with the following attributes:
Subject: C=US, ST=CA, L=Rocklin, OU=Site, O=Comp,
         CN=Leaf01
Key Type: RSA (2048)

Continue (y/n)? y
Self-signed certificate is created and enrolled successfully.

switch(config-cert-leaf-cert)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-cert-<CERT-NAME>`	Administrators or local user group members with execution rights for this command.

enroll terminal

`enroll terminal`

Description

Generates a key pair and certificate signing request (CSR) for the current leaf certificate. Use the CSR to obtain a signed certificate from a certificate authority (CA), and then import the certificate onto the switch with the command **import terminal**.

The key type, and the certificate common name in the subject fields of the current leaf certificate must be completed before running this command.

Example

Enrolling the leaf certificate **leaf-cert**:

```
switch(config-cert-leaf-cert)# enroll terminal
You are enrolling a certificate with the following attributes:
Subject: C=US, ST=CA, L=Rocklin, OU=Site, O=Comp,
         CN=Leaf01
Key Type: RSA (2048)

Continue (y/n)? y
```

```
-----BEGIN CERTIFICATE REQUEST-----
MIIBozCCAQwCAQAwYzEVMBMGA1UEAxMMcG9kMDEtODQwMC0xMQ4wDAYDVQQLEwV
nViYTEMMAoGA1UEChMDSFBFMRIwEAYDVQQHEwlSb3NldmlsbGUxCzAJBgNVBAgT
NBMQswCQYDVQQGEwJVUzCBnzANBgkqhkiG9w0BAQEFAAOBjQAwgYkCgYEAtKcLS
...
GBAJ4L3lFFfWBEL+KAKpOGjZcVmwlBMqSKFtOFNF9nzmUmONmU3SKy6dzQ+6ynR
7Au22mf3lWDxzrtCC/dj5RtWJeJekxp2LCIK/3eRXUwbYveQDKcxH7j9ZB+BAp2
ace+2tA68F2vlgRCQ/hcQH0YmNuaq4Ne3w0dhm7HlUrx
-----END CERTIFICATE REQUEST-----
switch(config-cert-leaf-cert)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-cert-<CERT-NAME>`	Administrators or local user group members with execution rights for this command.

import (CA-signed leaf certificate)

```
import terminal ta-profile <TA-NAME> [password <PW>]
import <REMOTE-URL> ta-profile <TA-NAME> [password <PW>][vrf <VRF-NAME>]
import <STORAGE-URL> ta-profile <TA-NAME> [password <PW>]
```

Description

Imports a CA-signed leaf certificate and then validates the certificate against the specified TA profile. If the imported data includes a private key, the private key must match the leaf certificate being imported. If the imported data does not include a private key, the certificate must match a CSR that was previously generated with the command **enroll terminal** and must be signed by the CA whose root certificate is installed in the specified TA profile. The TA profile must exist and have a TA certificate configured.

Parameter	Description
`terminal`	Import the certificate by pasting PEM-format data at the console. Upon execution, the **config-cert-import** context is entered for certificate pasting. To complete certificate data entry press Control-D in your terminal program. Alternatively, the pasted certificate data can include at its end the delimiter **END_OF_CERTIFICATE** (after the **-----END CERTIFICATE-----** line), making entry of Control-D unnecessary.
`ta-profile <TA-NAME>`	Specifies the TA profile name. Range: 1 to 48 alphanumeric

Parameter	Description
	characters excluding ".
`password <PW>`	Specifies the plaintext password used to decrypt the private key in the imported certificate data. When this parameter is omitted, the password is prompted for as required. Range: 1 to 32 alphanumeric characters.

<REMOTE-URL>	Specifies a certificate data file on a remote TFTP or SFTP server. The URL syntax is:
	`{tftp:// | sftp://<USER>@} {<IP>|<HOST>}`
	`[:<PORT>] [;blocksize=<SIZE>]/<FILE>`

`vrf <VRF-NAME>`	Specifies the name of the VRF to use for the remote URL file transfer. The default is **mgmt**.
<STORAGE-URL>	Available on switch families that provide USB device file import capability, specifies a certificate data file on a USB storage device inserted in the switch USB port. The URL syntax is **usb:/<FILE>**.

Usage

- The imported data must include all the intermediate CA certificates in the certificate chain leading to the certificate imported into the specified TA profile.
- This command cannot be used with the default certificate **local-cert**.
- The PEM data format is supported for all import sources. The PKCS#12 data format is supported for **<REMOTE-URL>** and **<STORAGE-URL>**.
- The PEM data must be delimited with these lines for the certificate data:

```
-----BEGIN CERTIFICATE-----
-----END CERTIFICATE-----
```

And the PEM data must be delimited with either of these line pairs for the private key data:

```
-----BEGIN PRIVATE KEY-----
-----END PRIVATE KEY-----

-----BEGIN ENCRYPTED PRIVATE KEY-----
-----END ENCRYPTED PRIVATE KEY-----
```

Examples

Importing a leaf certificate from the console:

```
switch(config)# crypto pki certificate leaf-cert
switch(config-cert-leaf-cert1)# import terminal ta-profile root-cert
Paste the certificate in PEM format below, then hit enter and ctrl-D:
switch(config-cert-import)# -----BEGIN CERTIFICATE-----
switch(config-cert-import)# MIIFRDCCAyygAwIBAgQP8nS2Vp15u0xXMdkDJzANBgkqhkiG9w0Bv
switch(config-cert-import)# MQswCQYDVQGEwJVUEOMAwGA1UCgwFXJ1YmDAgNBAMM1Jvb3QgQ0Ew
switch(config-cert-import)# HhcNMTkNDEwMjIwNT1WhcjIwMT0MjwNE1WjzQswQDVQQGEwJVUzEL
...
switch(config-cert-import)# 1fIYZYGQyla0AwFuPTTxBXHYwRxTPbUYU5umJfRPmE4VY8S9DQgcr
switch(config-cert-import)# 1NGNm3NG03GqPScs/TF9bVyFA5BOS5lmmkfRYK8D/kMTfRreSdxis
switch(config-cert-import)# YQ1u1NqShps=
switch(config-cert-import)# -----END CERTIFICATE-----
switch(config-cert-import)# -----BEGIN ENCRYPTED PRIVATE KEY-----
switch(config-cert-import)# MIIFDjBABgkqhkiG9wBBQ0wMzAbBgqkw0QwwDQIpJMN7sVGwCAggA
switch(config-cert-import)# MBQGCCqGSIb3DQMHAit+2qadNAASCgLYJ4Am3EfhH5p51Ggr86VqS
switch(config-cert-import)# IJ6L/UhEtH523nUkdV6gvAgoYaD83PswToAGv5VS8OMFTPttrn5/K
...
switch(config-cert-import)# OgSecqZsG6arbx0ESaYBir1c/6rPspcjbx283iD1MWOpeoS2aEmOX
switch(config-cert-import)# iKnXnUMpVPfLc74ty2S41DtH0X9gf6aa1jStg+7cND9XfGtjaV2+/
switch(config-cert-import)# cb4=
switch(config-cert-import)# -----END ENCRYPTED PRIVATE KEY-----
switch(config-cert-import)#
Enter import password: *******
Leaf certificate is validated with root-cert and imported successfully.
switch(config-cert-leaf-cert)#
```

Importing a leaf certificate from a remote file:

```
switch(config)# crypto pki certificate leaf-cert2
switch(config-cert-leaf-cert2)# import tftp://1.1.1.2/c2.p12 ta-profile root-cert
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  3722  100  3722    0     0   391k      0 --:--:-- --:--:-- --:--:--  391k
100  3722  100  3722    0     0   376k      0 --:--:-- --:--:-- --:--:--  376k
Enter import password: *******
Leaf certificate is validated with root-cert and imported successfully.
switch(config-cert-leaf-cert2)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-cert-<CERT-NAME>`	Administrators or local user group members with execution rights for this command.

import (self-signed leaf certificate)

```
import terminal self-signed [password <PW>]
import <REMOTE-URL> self-signed [password <PW>][vrf <VRF-NAME>]
import <STORAGE-URL> self-signed [password <PW>]
```

Description

Imports a self-signed leaf certificate including its matching private key.

Parameter	Description
`terminal`	Import the certificate by pasting PEM-format data at the console.

Parameter	Description
	Upon execution, the **config-cert-import** context is entered for certificate pasting. To complete certificate data entry press Control-D in your terminal program. Alternatively, the pasted certificate data can include at its end the delimiter **END_OF_CERTIFICATE** (after the **-----END CERTIFICATE-----** line), making entry of Control-D unnecessary.
`password` *`<PW>`*	Specifies the plaintext password used to decrypt the private key in the imported certificate data. When this parameter is omitted, the password is prompted for as required. Range: 1 to 32 alphanumeric characters.

`<REMOTE-URL>`	Specifies a certificate data file on a remote TFTP or SFTP server. The URL syntax is:
	`{tftp:// | sftp://<USER>@} {<IP>|<HOST>}`
	`[:<PORT>] [;blocksize=<SIZE>]/<FILE>`

`vrf` *`<VRF-NAME>`*	Specifies the name of the VRF to use for the remote URL file transfer. The default is **mgmt**.
`<STORAGE-URL>`	Available on switch families that provide USB device file import capability, specifies a certificate data file on a USB storage device inserted in the switch USB port. The URL syntax is **usb:/<FILE>**.

Usage

- This command cannot be used with the default certificate **local-cert**.
- The PEM data format is supported for all import sources. The PKCS#12 data format is supported for **<REMOTE-URL>** and **<STORAGE-URL>**.
- The PEM data must be delimited with these lines for the certificate data:

```
-----BEGIN CERTIFICATE-----
-----END CERTIFICATE-----
```

And the PEM data must be delimited with either of these line pairs for the private key data:

```
-----BEGIN PRIVATE KEY-----
-----END PRIVATE KEY-----

-----BEGIN ENCRYPTED PRIVATE KEY-----
-----END ENCRYPTED PRIVATE KEY-----
```

Example

Importing a self-signed leaf certificate from the console:

```
switch(config)# crypto pki certificate ss-leaf-cert
switch(config-cert-ss-leaf-cert)# import terminal self-signed
Paste the certificate in PEM format below, then hit enter and ctrl-D:
switch(config-cert-import)# -----BEGIN CERTIFICATE-----
switch(config-cert-import)# MIID2TCCAsGgAwIBAgIJAKcrqokm6p9GMA0GCSqGSIb3DQEBCwUAM
switch(config-cert-import)# tDCCA5ygAwIBAgICEAEwDQYJKoZIhvcNAQELBQAwgYgxCzABAYTAl
switch(config-cert-import)# VQQGEwJVUzELMAkGA1UECAwCQ0ExDTALBgNVBAcMBFJvc2UxDDAKB
...
switch(config-cert-import)# +fWQLxhp+jKJGZGOZz/FENt2uSfZHzlXiu8n3g+EgqExenY1pBRJr
switch(config-cert-import)# VuEEoNb/YfkPXHHva4Zfx223q+f694wlVsHkENSzqr2goHpa2fOzq
switch(config-cert-import)# alewwdmVqCES+x8bvhf3C/6IB6ePkEsnMlHNTeM=
switch(config-cert-import)# -----END CERTIFICATE-----
switch(config-cert-import)# -----BEGIN ENCRYPTED PRIVATE KEY-----
switch(config-cert-import)# MIIFDjBABgkqhkiG9w0BBQ0wMzAbBgkqhkiG9w0BBQwwDgQIt8Ni3
switch(config-cert-import)# MBQGCCqGSIb3DQMHBAiBHrejkcdpdASCBMjVxrrYYPNt3V1abr9k8
switch(config-cert-import)# 5GE0U99awh9ys4360WR95xOFGThvjkTyRWG511nGwVeLZs/7TPXWI
...
switch(config-cert-import)# hzc5ZT/w2F08icRI5mFbGoTAAw9IIWMOXGweaWQJDyKGrhg89GrnV
switch(config-cert-import)# M2UuP/tYuuO328QcenKZEJmZKCbx78oFRR+pgma4oeMaFTIyXE6Pr
switch(config-cert-import)# GAdCK8tkDiJ9DKbqdM5W0/nTJfqwUQlfl27dNrBAodsHdrw3UR99H
switch(config-cert-import)# SPo=
switch(config-cert-import)# -----END ENCRYPTED PRIVATE KEY-----
switch(config-cert-import)#
Enter import password: *******
Leaf certificate is validated as self-signed certificate and imported
successfully.
switch(config-cert-ss-leaf-cert)#
```

Importing a leaf certificate from a remote file:

```
switch(config)# crypto pki certificate ss-leaf-cert2
switch(config-cert-ss-leaf-cert2)# import tftp://1.1.1.2/ss2.p12 self-signed
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  3230  100  3230    0     0   875k      0 --:--:-- --:--:-- --:--:--  875k
100  3230  100  3230    0     0   831k      0 --:--:-- --:--:-- --:--:--  831k
Enter import password: *******
Leaf certificate is validated as self-signed certificate and imported
successfully.
switch(config-cert-ss-leaf-cert2)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-cert-`*<CERT-NAME>*	Administrators or local user group members with execution rights for this command.

key-type

key-type {rsa [key-size *<K-SIZE>*] | ecdsa [curve-size *<C-SIZE>*]}

Description

Sets the key type and key size for the current leaf certificate. The key type of the default certificate **local-cert** cannot be changed.

Parameter	Description
`rsa`	Selects the RSA key type.
`key-size <K-SIZE>`	Specifies the RSA key size in bits. Supported values: 2048, 3072, 4096. Default: 2048
`ecdsa`	Selects the ECDSA key type.
`curve-size <C-SIZE>`	Specifies the ECDSA elliptic curve size in bits. Supported values: 256, 348, 521. Default: 256

Examples

Setting RSA encryption on the leaf certificate **leaf-cert**:

```
switch(config)# crypto pki certificate leaf-cert
switch(config-cert-leaf-cert)# key-type rsa key-size 3072
```

Setting ECDSA encryption on the leaf certificate **leaf-cert**:

```
switch(config)# crypto pki certificate leaf-cert
switch(config-cert-leaf-cert)# key-type ecdsa curve-size 521
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-cert-<CERT-NAME>`	Administrators or local user group members with execution rights for this command.

ocsp disable-nonce

```
ocsp disable-nonce
no ocsp disable-nonce
```

Description

Configures exclusion of the nonce from OCSP requests. A nonce is a unique identifier that an OCSP client inserts in an OCSP request and expects the OCSP responder to include it in the corresponding OCSP response. The nonce mechanism helps prevent replay attacks in which a malicious player attempts to masquerade as the OCSP responder. Although the nonce is included by default, it can be excluded. Some OCSP responders choose to not support the use of the nonce due to performance considerations.

The **no** form of this command re-enables nonce inclusion in OCSP requests.

Examples

Disable inclusion of the nonce in OCSP requests for TA profile **root-cert**:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# ocsp disable-nonce
```

Enable inclusion of the nonce in OCSP requests for TA profile **root-cert**:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# no ocsp disable-nonce
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-ta-<TA-NAME>`	Administrators or local user group members with execution rights for this command.

ocsp enforcement-level

```
ocsp enforcement-level {strict | optional}
no enforcement-level
```

Description

Sets either strict or reduced enforcement of the OCSP check of certificates. Strict enforcement is enabled by default.

The **no** form of this command resets enforcement to its default of **strict**.

Parameter	Description
`strict`	Sets strict OCSP checking of certificates. The certificate is accepted only if all possible checking (including validation failures, software system errors, configuration errors, transactional errors) is successful.
`optional`	Sets reduced OCSP checking of certificates. The certificate is

Parameter	Description
	accepted unless one or more of these validation errors occur: ■ Response signature invalid. ■ Nonce in response mismatch. ■ Certificate revoked, but only when revocation checking is possible. if revocation check is not possible, the certificate is still accepted if there are no other validation errors.

Examples

Setting reduced OCSP checking of certificates:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# ocsp enforcement-level optional
```

Setting strict OCSP checking of certificates:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# ocsp enforcement-level strict
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-ta-<TA-NAME>`	Administrators or local user group members with execution rights for this command.

ocsp url

```
ocsp url {primary | secondary} <URL>
no ocsp url {primary | secondary}
```

Description

Configures the OCSP responder URLs that the current TA profile uses to verify the revocation status of an X.509 digital certificate. These URLs override the OCSP responder URL contained within the peer certificate being verified (as well as URLs defined in any intermediate CAs in the chain of trust).

If no OCSP responder URLs are defined for a TA profile (default setting), then the OCSP responder URL in the peer certificate is used for revocation status checking. (The OCSP responder URL is contained in a certificate's Authority Information Access field, which is an X.509 v3 certificate extension.)

The **no** form of this command deletes the specified OCSP responder URL (primary or secondary) from the current TA profile.

Parameter	Description
`{primary | secondary} <URL>`	Specify the HTTP URL of the primary or secondary OCSP responder using either a fully qualified domain name or IPv4 address.

Examples

Defining the primary OCSP URL for the TA profile **root-cert**:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# revocation-check ocsp
switch(config-ta-root-cert)# ocsp url primary http://ocsp-server.site.com
```

Removing the primary OCSP URL from the TA profile **root-cert**:

```
switch(config)# crypto pki ta-profile oot-cert
switch(config-ta-root-cert)# revocation-check ocsp
switch(config-ta-root-cert)# no ocsp url primary
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-ta-<TA-NAME>`	Administrators or local user group members with execution rights for this command.

ocsp vrf

```
ocsp vrf <VRF-NAME>
no ocsp vrf
```

Description

Sets the VRF that the switch uses to communicate with OCSP responders for OCSP checking. VRF mgmt is used by default.

The **no** form of this command resets the VRF to its default **mgmt**.

Parameter	Description
<VRF-NAME>	Specifies the name of the VRF the switch uses to communicate with OCSP responders. Default: **mgmt**.

Examples

Setting the OCSP responder VRF to **corp1**:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# ocsp vrf corp1
```

Reverting the OCSP responder VRF to its default:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# no ocsp vrf
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-ta-*<TA-NAME>*	Administrators or local user group members with execution rights for this command.

revocation-check ocsp

```
revocation-check ocsp
no revocation-check
```

Description

Enables certificate revocation checking for the current profile using the online certificate status protocol (OCSP).

The **no** form of this command disables certificate revocation checking for the current profile.

Examples

Enabling revocation checking for the TA profile **root-cert**:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# revocation-check ocsp
```

Disabling revocation checking for the TA profile **root-cert**:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# no revocation-check
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-ta-<TA-NAME>`	Administrators or local user group members with execution rights for this command.

show crypto pki application

`show crypto pki application`

Description

Shows certificate information for all features (applications) using leaf certificates that are managed by PKI.

Examples

Showing certificate information for all features (applications) using leaf certificates:

```
switch# show crypto pki application1

Associated Applications  Certificate Name       Cert Status
------------------------ ---------------------- --------------------------------
https-server                                    not configured, using local-cert
syslog-client            local-cert             valid
hsc                      xhsccert               invalid, using local-cert
radsec-client            device-identity        valid
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show crypto pki certificate

`show crypto pki certificate [<CERT-NAME> [plaintext | pem]]`

Description

Shows a list of all configured leaf certificates, or detailed information for a specific leaf certificate.

Possible values for Cert Status are: **CSR pending**, **expired**, **expires soon**, **installed**, **malformed**, **not yet known**.

Possible values for EST Status are: **enroll failed**, **enroll pending**, **enroll retrying**, **enroll success**, **n/a** (certificate is not EST-enrolled), **reenroll failed**, **reenroll pending**, **reenroll retrying**.

Parameter	Description
<CERT-NAME>	Specifies the leaf certificate name. Range: 1 to 32 alphanumeric characters excluding ".
`plaintext`	Shows certificate information in plain text.
`pem`	Shows certificate information in PEM format.

Examples

Showing a list of all configured leaf certificates:

```
switch# show crypto pki certificate

Certificate Name     Cert Status    EST Status        Associated Applications
-------------------- -------------- ----------------- ----------------------------
--
local-cert           installed      n/a               radsec-client, captive-
portal
device-identity      installed      n/a               none
pod01-test-1         installed      n/a               dot1x-supplicant
pod01-99-1           installed      n/a               https-server, est-client
syslog-1             CSR pending    enroll retrying   syslog-client
leaf-cert1           installed      enroll success    none
leaf-cert2           CSR pending    enroll failed     none
```

Showing detailed information (in plaintext format) for leaf certificate **pod01-99-1**:

```
switch# show crypto pki certificate pod01-99-1 plaintext

  Certificate Name: pod01-99-1
  Associated Applications:
    https-server, est-client
  Certificate Status: installed
  EST Status: n/a
  Certificate Type: regular
  Intermediates:
    Subject: C = US, ST = CA, O = Company, OU = Lab-IT, CN = DeviceCA
      Issuer: C = US, ST = CA, O = Company, OU = Lab-IT, CN = Lab-CA
      Serial Number: 0x02
    Subject: C = US, ST = CA, O = Company, OU = Lab-IT, CN = Lab-CA
      Issuer: C = US, ST = CA, O = Company, OU = Lab-IT, CN = Lab-Root
      Serial Number: 0x01
  Certificate:
    Data:
        Version: 1 (0x0)
        Serial Number: 14529416756121781768 (0xc9a2db8f3e3f4608)
    Signature Algorithm: sha256WithRSAEncryption
        Issuer: C=US, ST=CA, OU=Lab-IT, O=Company, CN=DeviceCA
        Validity
            Not Before: Jan 12 23:36:57 2018 GMT
            Not After : Nov  1 23:36:57 2020 GMT
        Subject: C=US, ST=CA, OU=Lab-IT, O=Company, CN=pod01-99-1
        Subject Public Key Info:
            Public Key Algorithm: rsaEncryption
                Public-Key: (2048 bit)
                Modulus:

                    00:a0:cd:ef:1b:f9:b8:bd:39:fc:7a:0e:00:17:ff:
                    2b:72:d8:4e:d4:df:49:36:ca:3a:f9:05:05:d7:e3:
                    d1:97:29:71:e6:33:b8:bb:8e:f0:ee:a6:e4:4a:f8:
                    ...
                    fe:dd:d9:a0:af:59:47:25:b4:34:06:af:03:1d:33:
                    30:c3:85:fe:5c:e7:19:7f:ff:3a:b2:21:b8:e8:ed:
                    83:09
                Exponent: 65537 (0x10001)
    Signature Algorithm: sha256WithRSAEncryption
         39:f6:03:86:03:d9:05:61:39:25:5f:0d:75:cc:05:ae:04:7e:
         4c:a3:13:0b:f0:1e:af:68:0e:40:9f:ed:48:b6:5e:56:8c:53:
         46:5b:c9:a4:e0:b0:bc:31:4b:a7:5d:0a:ed:7c:9c:f6:bf:1e:
         ...
         39:f5:26:58:68:e2:13:ec:94:ac:60:8e:4b:b0:ba:45:cf:d6:
         6a:4b:9f:7d:ae:3f:e5:2e:81:fe:ac:b3:65:44:35:47:a5:2f:
         89:e7:58:a0
```

Showing detailed information (in PEM format) for leaf certificate **leaf-cert1** with a status of **CSR pending**:

```
switch# show crypto pki certificate leaf-cert1 pem

  Certificate Name: leaf-cert1

  Associated Applications:
    syslog-client
  Certificate Status: CSR pending
  EST Status: enroll retrying
  Certificate Type: regular
    -----BEGIN CERTIFICATE REQUEST-----

    MIICtTCCAZ0CAQAwcDEWMBQGA1UEAxMNc3lzbG9nLTg0MBYGA1UECxMPQ
    XJ1YmEtUm9zZXZpbGxlMQ4wDAYDVQQKEYTESMBAGA1EBxMJUm9zZXZpbG
    xlMQswCQYDVQQIEwJDQTELMAGA1UEBhMCVVMwggEiMSIb3DQEBAQUAA4I
    ...
    cw2ytN6Idgh81k59x6DH7V/eORaKd5lq+oO7nkr6+QBf5L3f5Kb+TOFio
    lei+EdCHMxxc07MK0n3dkziSW25HFUGsyEXVMK+BID3zbKDoUe6XVhvqI
```

```
mamXyghigLYDcbsn6WVw==
-----END CERTIFICATE REQUEST-----
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

show crypto pki ta-profile

```
show crypto pki ta-profile [<TA-NAME>]
```

Description

Shows a list of all configured TA profiles, or detailed information for a specific profile.

This command shows information for both directly-configured TA profiles and TA profiles that were dynamically downloaded from EST servers.

Parameter	Description
<TA-NAME>	Specifies the TA profile name. Range: 1 to 48 alphanumeric characters excluding ".

Examples

Showing a list of all configured TA profiles:

```
switch# show crypto pki ta-profile

Profile Name                     TA Certificate     Revocation Check
-------------------------------- ------------------ ----------------
BASE_CA                          Installed,valid    disabled
BASE02_CA                        Installed,expired  disabled
root-cert                        Installed,valid    OCSP
ROOT-A_CA                        Not Installed      OCSP
EST-Service1                     Installed,valid    None
EST-Service2                     Installed,valid    None
```

Showing detailed information for TA profile **root-cert**:

```
switch# show crypto pki ta-profile root-cert

  TA Profile Name         : root-cert
  Revocation Check        : OCSP
    OSCP Primary URL      : http://ocsp1.domain.com
    OCSP Secondary URL    : Not Configured
    OCSP Disable-nonce    : false
    OCSP Enforcement Level: strict
    OCSP VRF              : mgmt
  TA Certificate: Installed and valid
    Version: 3 (0x2)
    Serial Number:
       74:e6:6d:22:3f:52:cc:94:43:41:ab:66:a8:8d:47:b1
    Signature Algorithm: sha1withRSAEncryption
    Issuer: OU=DeviceTrust, OU=Operations, O=Site, C=US,
            CN=Site Trusted Computing Root CA 1.0
    Validity
       Not Before: Sep 14 03:12:06 2007 GMT
       Not After : Sep 14 03:21:14 2032 GMT
    Subject: OU=DeviceTrust, OU=Operations, O=Site, C=US,
             CN=Site Trusted Computing Root CA 1.0
    Subject Public Key Info:
       Public Key Algorithm: rsaEncryption
          RSA Public Key: (2048 bit)
          Modulus (2048 bit):
              30:0d:06:09:2a:86:48:86:f7:0d:01:01:01:05:33:
              03:82:01:0f:00:30:82:01:3a:02:82:01:01:00:ac:
              3d:60:3a:2e:ca:a4:34:db:5c:3b:6b:07:df:73:62:
              ...
              20:c8:df:63:14:5a:e8:d3:ea:83:d8:47:a3:b5:2e:
              bb:64:51:f0:be:13:b6:91:e4:32:45:58:5e:1f:0d:
              02:03:01:00:01
          Exponent: 65537 (0x10001)
    X509v3 extensions:
       X509v3 Key Usage:
          Digital Signature, Certificate Signing, CRL Signing
       X509v3 Basic Constraints:
          CA:TRUE, pathlen:4
       X509v3 Subject Key Identifier:
          eb:d7:ec:db:8a:cb:f2:51:d5:06:e1:42:7b:39:a7:d0:1e:31:6e:bf

    Signature Algorithm: sha1withRSAEncryption
       1c:90:f3:a4:f0:0d:e2:e3:e9:ae:01:e1:7d:a7:13:e2:cc:0b:
       17:31:26:92:a2:5d:1d:19:60:54:03:13:9b:e1:73:6c:e4:b3:
       01:4f:4e:ae:61:bd:ae:b6:12:d3:ab:08:ae:8c:47:92:d7:0d:
       ...
       ca:cf:11:78:55:6d:06:49:fa:d4:8d:f3:ef:7f:79:38:35:5d:
       16:5a:57:7f:a8:dc:b0:f8:a2:04:0d:17:0b:bb:58:32:30:e0:
       2d:a8:37:a2
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

ta-certificate

`ta-certificate { [import [terminal]] | import {<REMOTE-URL> | <STORAGE-URL>} }`

Description

Imports a CA certificate for use in the current TA profile. The certificate must be in PEM format. The PEM data must be delimited with these lines:

```
-----BEGIN CERTIFICATE-----
-----END CERTIFICATE-----
```

Only the first certificate in the PEM data is imported. Any additional certificates are ignored.

Parameter	Description
`[import [terminal]]`	Import the certificate by pasting PEM-format data at the console. Upon execution, the **config-cert-import** context is entered for certificate pasting. To complete certificate data entry press Control-D in your terminal program. Alternatively, the pasted certificate data can include at its end the delimiter **END_OF_CERTIFICATE** (after the **-----END CERTIFICATE-----** line), making entry of Control-D unnecessary.

`import <REMOTE-URL>`	Import the certificate from a file on a remote TFTP or SFTP server. The URL syntax is:
	`{tftp:// | sftp://<USER>@} {<IP>|<HOST>}`
	`[:<PORT>] [;blocksize=<SIZE>]/<FILE>`

`import <STORAGE-URL>`	Available on switch families that provide USB device file import capability, import the certificate from a file on a USB storage device inserted in the switch USB port. The URL syntax is **usb:/<FILE>**.

Example

Importing a certificate into the TA profile **root-cert** by pasting PEM-format certificate data at the console:

```
switch(config)# crypto pki ta-profile root-cert
switch(config-ta-root-cert)# ta-certificate import terminal
Paste the certificate in PEM format below, then hit enter and ctrl-D:
switch(config-ta-cert)# -----BEGIN CERTIFICATE-----
switch(config-ta-cert)# MIIDuTCCAqECCQCuoxeJ2ZNYcjANBgkqhkiG9w0BAQsFADCBqzELMAEBh
switch(config-ta-cert)# VVMxEzARBgNVBAgMCkNhbGlmb3JuaWExEDAOBgNVBAcMB1JvY2tsDAKBg
switch(config-ta-cert)# BAoMA0hQTjEVMBMGA1UECwwMSFBOUm9zZXZpbGxlMSowKAYDVQocG5zdz
...
switch(config-ta-cert)# x3WFf3dFZ8o9sd5LVAHneH/ztb9MP34z+le1V346r12L2kpxmTOVJVyTO
switch(config-ta-cert)# BIzD/ST/HaWI+0S+S80rm93PSscEbb9GWk7vshh5EnW/moehBKcE4O1zy
switch(config-ta-cert)# 3LvMLZcssSe5J2Ca2XIhfDme8UaNZ7syGYMsAW0nG7yYHWkEOQu9s
switch(config-ta-cert)# -----END CERTIFICATE-----
switch(config-ta-cert)#
```

```
The certificate you are importing has the following attributes:
Issuer:  C=US, ST=CA, L=Rocklin, O=Company, OU=Site,
         CN=site.com/emailAddress=test.ca@site.com
Subject: C=US, ST=CA, L=Rocklin, O=Company, OU=Site,
         CN=9000/emailAddress=test.ca@site.com
Serial Number: 12121221634631568498 (0xaea51217d5945772)

TA certificate import is allowed only once for a TA profile
Do you want to accept this certificate (y/n)? y
TA certificate accepted.
switch(config-ta-root-cert)#
```

Importing a certificate into the TA profile **root-cert2** from file **rcert2-data** on the USB device:

```
switch(config)# crypto pki ta-profile root-cert2
switch(config-ta-root-cert2)# ta-certificate import usb:/rcert2-data
The certificate you are importing has the following attributes:
Issuer: C=US, ST=California, L=Rocklin, O=Company, OU=Site,
CN=site.com/emailAddress=test.ca@site.com
Subject: C=US, ST=California, L=Rocklin, O=Company, OU=Site,
CN=9000/emailAddress=test.ca@site.com
Serial Number: 12121221634631568498 (0xaea51217d5945772)

TA certificate import is allowed only once for a TA profile
Do you want to accept this certificate (y/n)? y
TA certificate accepted.
switch(config-ta-root-cert2)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-ta-<TA-NAME>`	Administrators or local user group members with execution rights for this command.

subject

```
subject [common-name <COMMON-NAME>] [country <COUNTRY>] [locality <LOCALITY>]
        [org <ORG-NAME>] [org-unit <ORG-UNIT>] [state <STATE>]
```

Description

Sets the subject fields for the current leaf certificate. If the **common-name** parameter is not specified, then you are prompted to define a value for each field. If a configured value exists for any field, it is presented as the default.

The subject fields of the default certificate **local-cert** cannot be changed.

Parameter	Description
`common-name <COMMON-NAME>`	Specifies the common name.
`country <COUNTRY>`	Specifies the country or region.
`locality <LOCALITY>`	Specifies the locality such as city.
`org <ORG-NAME>`	Specifies the organization.
`org-unit <ORG-UNIT>`	Specifies the organizational unit.
`state <STATE>`	Specifies the state.

Examples

Setting subject fields for the leaf certificate **leaf-cert**:

```
switch(config-cert-leaf-cert)# subject common-name Leaf01 country US
locality CA org Company org-unit Site state CA
```

Setting subject fields for the leaf certificate **leaf-cert** interactively:

```
switch(config-cert-leaf-cert)# subject
Do you want to use the switch serial number as the common name (y/n)? n
Enter Common Name : Leaf01
Enter Org Unit : Site
Enter Org Name : Company
Enter Locality : Rocklin
Enter State : CA
Enter Country : US
switch(config-cert-leaf-cert)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-cert-<CERT-NAME>`	Administrators or local user group members with execution rights for this command.

Chapter 112

PKI EST commands

arbitrary-label

```
arbitrary-label <LABEL>
no arbitrary-label
```

Description

Within the EST profile context, configures the generic optional label (also known as arbitrary label) to be concatenated to the EST server URL that is configured with the **url** command. There is no arbitrary label configured by default. Any existing arbitrary label is replaced by this command. The use of arbitrary labels is optional.

RFC 7030 allows the use of arbitrary labels so that one EST server may serve multiple CAs with the same server URL that gets concatenated with different arbitrary labels. The same label is used for every request made under a particular EST profile.

Some EST schemes use arbitrary labels in a more sophisticated way, defining different labels for different types of requests under the same EST profile. For example, the CA certificate request could use the generic label (configured with this **arbitrary-label** command) , the certificate enrollment request could use the enrollment label (configured with the **arbitrary-label-enrollment** command), and the re-enrollment request could use the re-enrollment label (configured with the **arbitrary-label-reenrollment** command). Note that only one label of each of the three available types can be configured in any EST profile.

The **no** form of this command removes the generic arbitrary label.

Parameter	Description
<LABEL>	Specifies the generic arbitrary label. Range: Up to 64 characters.

Examples

Configuring the URL and generic arbitrary label. Note that with the URL and arbitrary label configured in this example, the final URL the switch uses to request CA certificates from the EST server is https://est-service999.com/.well-known/est/rsa2048/cacerts.

```
switch(config)# crypto pki est-profile EST-service1
switch(config)# url https://est-service999.com/.well-known/est
switch(config-est-EST-service1)# arbitrary-label rsa2048
```

Removing the generic arbitrary label:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no arbitrary-label
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-est-<EST-NAME>`	Administrators or local user group members with execution rights for this command.

arbitrary-label-enrollment

```
arbitrary-label-enrollment <LABEL>
no arbitrary-label-enrollment
```

Description

Within the EST profile context, configures the arbitrary enrollment label to be concatenated to the EST server URL that is configured with the **url** command. This label is specific to the enrollment operation. There is no arbitrary enrollment label configured by default. Any existing arbitrary enrollment label is replaced by this command. The use of arbitrary enrollment labels is optional.

When the enrollment label is not configured, the generic arbitrary label (created with the **arbitrary-label** command) is used (if configured) for enrollment.

RFC 7030 allows the use of arbitrary labels so that one EST server may serve multiple CAs with the same server URL that gets concatenated with different arbitrary labels. The same label is used for every request made under a particular EST profile.

Some EST schemes use arbitrary labels in a more sophisticated way, defining different labels for different types of requests under the same EST profile. For example, the CA certificate request could use the generic label (configured with the **arbitrary-label** command) , the certificate enrollment request could use the enrollment label (configured with this **arbitrary-label-enrollment** command), and the re-enrollment request could use the re-enrollment label (configured with the **arbitrary-label-reenrollment** command). Note that only one label of each of the three available types can be configured in any EST profile.

The **no** form of this command removes the arbitrary enrollment label.

Parameter	Description
<LABEL>	Specifies the arbitrary enrollment label. Range: Up to 64 characters.

Examples

Configuring the arbitrary enrollment label:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# arbitrary-label-enrollment ipsec-v7
```

Removing the arbitrary enrollment label :

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no arbitrary-label-enrollment
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-est-<EST-NAME>`	Administrators or local user group members with execution rights for this command.

arbitrary-label-reenrollment

```
arbitrary-label-reenrollment <LABEL>
no arbitrary-label-reenrollment
```

Description

Within the EST profile context, configures the arbitrary re-enrollment label to be concatenated to the EST server URL that is configured with the **url** command. This label is specific to the re-enrollment operation. There is no arbitrary re-enrollment label configured by default. Any existing arbitrary re-enrollment label is replaced by this command. The use of arbitrary re-enrollment labels is optional.

When the re-enrollment label is not configured, the generic arbitrary label (created with the **arbitrary-label** command) is used (if configured) for re-enrollment.

RFC 7030 allows the use of arbitrary labels so that one EST server may serve multiple CAs with the same server URL that gets concatenated with different arbitrary labels. The same label is used for every request made under a particular EST profile.

Some EST schemes use arbitrary labels in a more sophisticated way, defining different labels for different types of requests under the same EST profile. For example, the CA certificate request could use the generic label (configured with the **arbitrary-label** command) , the certificate enrollment request could use the enrollment label (configured with the **arbitrary-label-enrollment** command), and the re-enrollment request could use the re-enrollment label (configured with this **arbitrary-label-reenrollment** command). Note that only one label of each of the three available types can be configured in any EST profile.

The **no** form of this command removes the arbitrary re-enrollment label.

Parameter	Description
<LABEL>	Specifies the arbitrary re-enrollment label. Range: Up to 64 characters.

Examples

Configuring the arbitrary re-enrollment label:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# arbitrary-label-reenrollment ipsec-v7
```

Removing the arbitrary re-enrollment label :

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no arbitrary-label-reenrollment
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-est-*<EST-NAME>*	Administrators or local user group members with execution rights for this command.

crypto pki est-profile

```
crypto pki est-profile <EST-NAME>
no crypto pki est-profile <EST-NAME>
```

Description

Creates a certificate Enrollment over Secure Transport (EST) profile and changes to the **config-est-<EST-NAME>** context for the profile. Each EST profile stores information about the EST service, including EST server URL Up to 16 profiles can be created.

If the specified EST profile exists, this command changes to the **config-est-<EST-NAME>** context for the profile.

The **no** form of this command deletes the specified EST profile. It also deletes the TA profiles whose CA certificates were downloaded from the corresponding EST server, and the leaf certificates that were enrolled using this EST profile.

The deletion of the related TA profiles and enrolled certificates is permanent. If the EST profile is in the startup configuration and the EST profile is deleted but this deletion is not updated in the startup configuration before a switch reboot, the EST profile will still exist after the reboot but the related TA profiles and enrolled certificates will not exist.

Parameter	Description
<EST-NAME>	Specifies the EST profile name. Range: Up to 32 alphanumeric characters (excluding ").

Examples

Creating EST profile **EST-Service1**:

```
switch(config)# crypto pki est-profile EST-Service1
switch(config-est-service1)#
```

Removing EST profile **service1**:

```
switch(config)# no crypto pki est-profile EST-Service1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config`	Administrators or local user group members with execution rights for this command.

enroll est-profile

`enroll est-profile <EST-NAME>`

Description

Enrolls a leaf certificate through a remote EST (Enrollment over Secure Transport) server.

Per RFC 7030, EST enables clients to request certificate signing services over secure TLS connections. The switch generates a key pair and the corresponding CSR. The CSR is sent to the EST server to request signing, and the signed certificate is be returned to the switch where it is validated. If the whole process succeeds, the certificate can be used as a leaf certificate on the switch. When the leaf certificate approaches its expiry date, it will be renewed automatically through the same EST server.

Each enrollment or re-enrollment attempt starts with a **/cacerts** request sent to the EST server to get the latest chain of CA certificates. After the enrollment or re-enrollment succeeds, this chain of CA certificates will be compared with those downloaded previously from the same EST server. Updates will be made as appropriate.

The subject fields of the current leaf certificate must be defined before running this command. If the common name subject field is not configured, this command is rejected.

This command cannot be used to enroll or renew the default certificate "local-cert."

Parameter	Description
<EST-NAME>	Specifies an existing EST profile name. Range: Up to 32 alphanumeric characters (excluding ").

Example

Enrolling leaf certificate **leaf-cert1** through the EST server identified in EST profile **EST-service1**:

```
switch(config-cert-leaf-cert1)# enroll est-profile EST-service1
You are enrolling a certificate with the following attributes:
  Subject: C=US, ST=CA, L=Roseville, OU=Aruba-Roseville, O=Aruba,
         CN=leaf-cert1
  Key Type: RSA (2048 bits)

Continue (y/n)? y
Certificate enrollment via EST-service1 has been initiated.
Please use `show crypto pki certificate leaf-cert1` to check its status.

switch(config-cert-leaf-cert1)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-cert-`*<CERT-NAME>*	Administrators or local user group members with execution rights for this command.

reenrollment-lead-time

```
reenrollment-lead-time <LEAD-TIME>
no reenrollment-lead-time
```

Description

Within the EST profile context, sets the certificate re-enrollment lead time which is the number of days before certificate expiry date that certificate re-enrollment will be initiated.

The **no** form of this command resets the EST server re-enrollment lead time to its default of 2 days.

Parameter	Description
<LEAD-TIME>	Specifies the certificate re-enrollment lead time in days. Range: 0 to 30 days. Default: 2 days.

Examples

Setting the certificate re-enrollment lead time to 15 days:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# reenrollment-lead-time 15
```

Resetting the certificate re-enrollment lead time to its default of 2 days :

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no reenrollment-lead-time
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-est-*<EST-NAME>*	Administrators or local user group members with execution rights for this command.

retry-count

```
retry-count <RETRIES>
no retry-count
```

Description

Within the EST profile context, sets the maximum number of retires to be attempted after the initial certificate enrollment request fails.

The **no** form of this command resets the maximum number of certificate enrollment request retries to its default of 3.

Parameter	Description
<RETRIES>	Specifies the maximum number of certificate enrollment request retries. Range: 0 to 32 retries. Default: 3 retries.

Examples

Setting the retry count to 5 retries:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# retry-count 5
```

Resetting the retry count to its default of 3 retries:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no retry-count
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-est-*<EST-NAME>*	Administrators or local user group members with execution rights for this command.

retry-interval

```
retry-interval <INTERVAL>
no retry-interval
```

Description

Within the EST profile context, sets the interval at which a failed certificate enrollment request is retried.

The **no** form of this command resets the enrollment request retry interval to its default of 30 seconds.

Parameter	Description
<INTERVAL>	Specifies the enrollment request retry interval in seconds. Range: 30 to 600 seconds. Default: 30 seconds.

Examples

Setting the certificate enrollment request retry interval to 45 seconds:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# retry-interval 45
```

Resetting the retry interval to its default of 30 seconds:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no retry-interval
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-est-`*`<EST-NAME>`*	Administrators or local user group members with execution rights for this command.

show crypto pki est-profile

`show crypto pki est-profile [`*`<EST-NAME>`*`]`

Description

Shows a list of all configured EST profiles, or detailed information for a specific profile.

Parameter	Description
`<EST-NAME>`	Specifies the EST profile name. Range: Up to 32 alphanumeric characters (excluding ").

Examples

Showing a list of all configured EST profiles:

```
switch# show crypto pki est-profile
                                 Downloaded  Enrolled
Profile Name                     TA Profiles Certificates
-------------------------------- ----------- ------------
EST-service1                     2           3
EST-service2                     1           2
EST-service3                     2           0
```

Showing detailed information for EST profile **EST-service1**:

```
switch# show crypto pki est-profile EST-service1
  Profile Name              : EST-service1
  Service VRF               : mgmt
  Service URL               : https://est-service999.com
    Arbitrary Label                 : not configured
    Arbitrary Label Enrollment    : /ipsec-VP7
    Arbitrary Label Reenrollment : not configured
  Authentication Username  : est1
  Authentication Password  :
    AQBapREALpWYm2z7L1LanOtR3vGkqhBN1hBUU2CuvQXUF/ggYgAAnAnGTnKq49P4c
    dNQ6UqPbjHL4XzCO0T04djkhSUxPKGfnsWuFEONveh+JbEobqKImfwJjc3eWHiaUb
    eNpPx2zN2Q1DdyxAAQi4rmKr8LITMTTMd7qr
  Retry Interval            : 45 seconds
  Retry Count               : 5 times
  Reenrollment Lead Time    : 2 days
  Downloaded TA Profiles    : 2
  Enrolled Certificates     :
    leaf-cert1
    leaf-cert2
    leaf-cert3
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

url

```
url <URL>
no url
```

Description

Within the EST profile context, configures the URL of the certificate enrollment EST server. This is not configured by default. Any existing URL is replaced by this command.

The **no** form of this command removes the EST server URL within the selected EST profile. The removal of the URL does not affect the TA profiles and enrolled certificates from the EST server.

Parameter	Description
<URL>	Specifies the EST server URL. Range: Up to 192 characters.

Usage

- The configuration and update of the EST profile URL triggers the sending of a **/cacerts** request to the EST server. A successful request will result in a chain of trusted CA certificates being downloaded from the EST server. Each CA certificate, either root CA certificates or intermediate CA certificates, will be saved as a TA profile, with TA profile name **<est-name>-est-taNN** with **NN** representing two numerical digits. This TA profile naming scheme with the **-est-taNN** suffix is reserved for TA profiles downloaded from EST servers.
- Upon connection with an EST server, the switch authenticates the server by validating the server certificate. For this validation to succeed, a TA profile needs to pre-exist in the switch with a CA certificate from the issuer chain of the server certificate. Once the server is authenticated, all CA certificates in its **/cacerts** response will be trusted, with no further validation occurring for them.
- The TA profiles with CA certificates downloaded from an EST server will have their revocation check set to OCSP, enforcement set to optional, and the OCSP VRF set to the same as that of the EST profile.

Examples

Configuring the EST server URL:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# url https://est-service999.com/.well-known/est
```

Removing the EST server URL:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no url
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-est-<EST-NAME>`	Administrators or local user group members with execution rights for this command.

username

```
username <USERNAME> password [ciphertext <CIPHERTEXT-PASSWORD> |
         plaintext <PLAINTEXT-PASSWORD>]
no username
```

Description

Within the EST profile context, configures the user account information for the EST server that is used to authenticate the switch before accepting requests from the switch. This is not configured by default. Any existing username and password is replaced by this command.

When entered without either optional **ciphertext** or **plaintext** parameters, the plaintext password is prompted for twice, with the characters entered masked with "*" symbols.

The **no** form of this command removes the user account information within the selected EST profile.

There are two ways the EST client on a CX switch can prove itself to an EST server: a certificate, and/or username and password. At least one of the two must be configured for the EST request to succeed. If both are configured, certificate authentication will be used. If a certificate is not configured or certificate authentication fails, and username and password is configured, the username and password will be sent to the EST server for authentication.

Parameter	Description
`<USERNAME>`	Specifies the EST server account user name. The exact user name requirements are set by the chosen EST service. Range: Up to 32 alphanumeric characters.
`ciphertext <CIPHERTEXT-PASSWORD>`	Specifies the EST server account password as Base64 ciphertext. No password prompts are provided and the ciphertext password is validated before the configuration is applied for the user. **NOTE:** The ciphertext password must be gotten from the EST service.
`plaintext <PLAINTEXT-PASSWORD>`	Specifies the password without prompting. The password is visible as cleartext when entered but is encrypted thereafter. The exact password requirements are set by the chosen EST service. Range: Up to 64 alphanumeric characters.

Examples

Configuring an EST user with prompted cleartext password entry :

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# username est1 password
Enter password: ********
Confirm password: ********
switch(config-est-EST-service1)#
```

Configuring an EST user with direct cleartext password entry:

```
switch(config)# crypto pki est-profile EST-service2
switch(config-est-EST-service2)# username est1 password plaintext concept_leap739
```

Configuring an EST user with ciphertext password entry :

```
switch(config)# crypto pki est-profile EST-service3
switch(config-est-EST-service3)# username est1 password ciphertext
AQBpRALpWYm2z7L1LanOtR3vGkqhN1hBU2CuvQXUF/ggYgAAAHWaPqxU6nAnGTnKq49P4cdNQ6U
qPbjHL4XzO0T04djkUPKGfnsWuFEONveh+JbEobq63+1k80qBKImfwJjc3eWHiaUbeNpPx2zN2Q
1DdyxAAQi4rmKr8LITMTTMd7qr
```

Removing the EST user account information for EST profile EST-service2:

```
switch(config)# crypto pki est-profile EST-service2
switch(config-est-EST-service2)# no username
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	config-est-*<EST-NAME>*	Administrators or local user group members with execution rights for this command.

vrf

```
vrf <VRF-NAME>
no vrf
```

Description

Within the EST profile context, selects the VRF through which the EST server can be reached. Any existing VRF selection is replaced by this command. When this command is not used, VRF **mgmt** is used by default on switch families supporting the **mgmt** VRF, otherwise the default VRF named **default** is used.

The **no** form of this command selects the default VRF either **mgmt** or **default**.

Parameter	Description
<VRF-NAME>	Specifies the name of the VRF to use for EST server communication.

Examples

Selecting VRF **it-services** for EST server communications:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# vrf it-services
```

Resetting the VRF to its default of **mgmt** for EST server communications:

```
switch(config)# crypto pki est-profile EST-service1
switch(config-est-EST-service1)# no vrf
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-est-<EST-NAME>`	Administrators or local user group members with execution rights for this command.

Chapter 113
PoE commands

All PoE configuration commands except **threshold configuration** and **always-on poe configuration** are entered at the **config-if** context. The PoE threshold command is used at the system level whereas the **always-on poe**and **power-over-ethernet quick-poe** commands are set at the slot level. These commands can only be configured in the global configuration context.

lldp dot3 poe

```
lldp dot3 poe
no lldp dot3 poe
```

Description

Enables 802.3 TLV list in LLDP to advertise for Power over Ethernet Data Link Layer Classification. LLDP dot3 TLV is by default enabled for PoE.

The **no** form of this command disables 802.3 TLV list in LLDP.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling 802.3 TLV list in LLDP:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp dot3 poe
```

Disabling 802.3 TLV list in LLDP:

```
switch(config-if)# no lldp dot3 poe
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

lldp med poe

```
lldp med poe [priority-override]
no lldp med poe [priority-override]
```

Description

Enables MED TLV list in LLDP to advertise for Power over Ethernet Data Link Layer Classification. Also enables the lldp-MED TLV priority to override user configured port priority for Power over Ethernet. When both dot3 and MED are enabled, dot 3 will take precedence. MED TLV is by default enabled for PoE. Priority over-ride is by default disabled.

The **no** form of this command disables MED TLV list in LLDP.

Parameter	Description
`[priority-override]`	System defined name of the interface.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling and disabling LLDP MED PoE:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp med poe
switch(config-if)# no lldp med poe
```

Enabling and disabling LLDP MED PoE priority override:

```
switch(config-if)# lldp med poe priority-override
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet

```
power-over-ethernet
no power-over-ethernet
```

Description

Enables per-interface power distribution. Per-port power is enabled by default with priority low. PoE cannot be disabled for individual ports when Quick PoE is enabled for the entire switch or line module.

The **no** form of this command disables per-interface power distribution.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling per-interface power distribution:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet
```

Disabling per-interface power distribution:

```
switch(config-if)# no power-over-ethernet
```

Showing Quick PoE enabled:

```
switch(config-if)# power-over-ethernet quick-poe 1/1
switch(config-if)# interface 1/1/1
switch(config-if)# no power-over-ethernet
Interface PoE cannot be disabled when Quick PoE is enabled.
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet allocate-by

```
power-over-ethernet allocate-by {usage | class}
no power-over-ethernet allocate-by {usage | class}
```

Description

Configures the power allocation method. Power allocation method is initially based on usage. PSE Allocated power value will change to LLDP negotiated power if and when LLDP exchange takes place between PSE and PD. When there is no LLDP negotiation, PSE Allocated Power Value will be the actual instantaneous power draw and reserve power based on actual consumption. In allocate-by class, power allocation is based on PD requested class and PSE allocated power value will be the LLDP negotiated power when LLDP exchange takes place between PSE and PD. When there is no LLDP negotiation, PSE Allocate Power will be based on PD class. Reserve power is based on PD Class. By default, power allocation is by usage.

The power allocation method can be changed on an interface through port-access (User roles or RADIUS). An allocation method when configured through port-access will replace the user configured method.

The **no** form of this command resets the action to default.

Parameter	Description
`usage`	Configures the usage-based allocation method.
`class`	Configures the class-based allocation method.

Usage

If you enable **pd-class-override** for an interface, the **allocate-by** configuration of that interface will be automatically changed to **class**. However, if you change the allocation method to **usage** when **pd-class-override** is still enabled, you will receive an error message stating that "The power allocation method cannot be changed when pd-class-override is enabled."

To remove **pd-class-override**, you can use the **no power-over-ethernet pd-class-override** command . It is important to note that **pd-class-override** requires the allocation method to be set to **class** and is enforced when configured through CLI. However, if you override the allocation method to **usage** via port-access, **pd-class-override** will not be in effect. Therefore, it is recommended that you do not override the allocation method to **usage** through port-access on interfaces configured with **pd-class-override**.

Examples

On the 6400 Switch Series, interface identification differs.

Configuring the power allocation method:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet allocate-by usage
switch(config-if)# power-over-ethernet allocate-by class
```

Resetting power allocation method:

```
switch(config-if)# no power-over-ethernet allocate-by class
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet always-on

```
power-over-ethernet always-on <MODULE-ID>
no power-over-ethernet always-on <MODULE-ID>
```

Description

Always-on PoE is a feature that provides the ability to the switch to continue to provide power across a soft reboot. It is applicable only to the interfaces which were connected and delivering before the soft reboot. Also, power will not be delivered if power to the switch is interrupted. This command enables or disables the always-on PoE feature at the switch or the slot level. By default, always-on PoE is enabled at the switch or the slot level.

The **no** form of this command disables power distribution on soft reboot.

Parameter	Description
<MODULE-ID>	Module number to apply always-on PoE configuration.

Examples

Enabling per-interface power distribution:

```
switch(config)# power-over-ethernet always-on 1/1
```

Disabling per-interface power distribution:

```
switch(config)# no power-over-ethernet always-on 1/1
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

power-over-ethernet assigned-class

```
power-over-ethernet assigned-class {3 | 4 | 6}
no power-over-ethernet assigned-class
```

Description

Limit PoE power based on the assigned class. When an user assigns a maximum class to an interface, the PSE will limit the maximum power delivered to the PD up to a total power draw not exceeding the PSE assigned-class power. Power demotion occurs when a PD requested class is higher than the PSE assigned class, permitting the PD to receive power and operate in a reduced power mode. PoE ports cannot set an assigned class when Quick PoE is enabled on the sybsystem. The default assigned class is 4 for 2-pair capable PSE and 6 for 4-pair capable PSE.

The **no** form of this command resets the action to default.

Examples

On the 6400 Switch Series, interface identification differs.

Setting PoE assigned class:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet assigned-class 4
```

Resetting PoE assigned class to default:

```
switch(config-if)# no power-over-ethernet assigned-class 4
```

Showing Quick PoE enabled:

```
switch(config)# power-over-ethernet quick-poe 1/1
switch(config)# interface 1/1/1
switch(config)# power-over-ethernet assigned-class 4
Interface assigned class cannot be configured when Quick PoE is enabled.
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet power-pairs

```
power-over-ethernet power-pairs {alt-a | alt-a-and-alt-b}
no power-over-ethernet power-pairs {alt-a | alt-a-and-alt-b}
```

Description

Configures the four-pair capable switch to operate in a mode, that restricts the power delivery for class 0 to class 4 single signature devices to operate only on ALT-A power pair.

When configured, a warning message is displayed. User must accept the warning by entering **Y** to enable the mode.

The **no** form of this command resets the power pairs to default PoE pairs.

Parameter	Description
`alt-a`	Delivers power only on the ALT-A pair.
`alt-a-and-alt-b`	Delivers power on the ALT-A and ALT-B pairs. This is the default configuration on all PoE interfaces.

Usage

IEEE 802.3bt devices such as four-pair (class 5 and higher) and dual signature powered devices require power on both pairs. However, there is no such restriction on IEEE 802.3af (class 0 to class 3) and IEEE 802.3at (class 4) powered devices not to draw power on both pairs if the overall consumption does not violate the power class limit. For such powered devices, a **power-pairs** configuration is provided to configure the 4-pair capable switch to restrict power on only one power pair.

Examples

Configuring PoE power pairs:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet power-pairs alt-a

This setting configures the interface to deliver power only on the ALT-A
cable pair when a Class 0-4 device is connected. Devices that require power
on all pairs may not operate correctly.

Continue (y/n)? y
```

Resetting the PoE power pair to default:

```
switch(config-if)# no power-over-ethernet power-pairs alt-a


This setting configures the interface to deliver power on the ALT-A
and ALT-B cable pairs. This is the default and most devices work
properly with this setting, however some older Class 0-4 devices may
not operate correctly.

Continue (y/n)? y
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.09	Command Introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet pre-std-detect

```
power-over-ethernet pre-std-detect
no power-over-ethernet pre-std-detect
```

Description

Before IEEE 802.3 released the first Power over Ethernet standard (802.3af), vendors had shipped PoE capable switches and PD's. As we are backward compatible Aruba will support both IEEE standard and pre-standard 802.3af Power over Ethernet PD's concurrently. This CLI allows the user to enable or disable pre-802.3af-standard device detection and powering on the specific port. When pre-std-detect is enabled, power will be delivered on PairA only. Default is disabled.

The **no** form of this command resets the action to default.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling standard device detection:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet pre-std-detect
```

Disabling standard device detection:

```
switch(config-if)# no power-over-ethernet pre-std-detect
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet priority

```
power-over-ethernet priority {critical | high | low}
no power-over-ethernet priority {critical | high | low}
```

Description

Sets PoE priority for an interface Specifying critical, high, or low indicates the priority of the interface in the event of power over-subscription. Within the same priority level, higher power-priority line-module ports have higher precedence. With same PoE priority and same line-module priority, lower numbered line-module ports have higher precedence. Per-interface PoE priority is low by default.

The **no** form of this command resets the priority to default PoE priority "low".

Examples

Configuring PoE priority:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet priority critical
switch(config-if)# power-over-ethernet priority high
```

Resetting the PoE priority to default:

```
switch(config-if)# no power-over-ethernet priority high
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet quick-poe

```
power-over-ethernet quick-poe <MODULE-ID>
```

```
no power-over-ethernet
```

Description

Quick PoE is a feature that provides the ability for the switch to provide power to the connected powered device as soon as switch goes through cold reboot. When quick PoE is enabled on the subsystem PoE port disablement and PD demotion is not allowed. also quick PoE enablement is not allowed if any of the port is disabled on the subsystem. User should not over-subscribe the PoE power when quick PoE is enabled. Quick PoE saved configuration will work irrespective of the configuration change at reboot.

Enables quick PoE feature on the switch or the subsystem level. By default, quick-PoE is disabled for the subsystem.

The **no** form of this command disables quick PoE.

Parameter	Description
<MODULE-ID>	Specifies module number for quick PoE configuration .

Examples

On the 6400 Switch Series, interface identification differs.

Enabling and disabling quick PoE:

```
switch(config)# power-over-ethernet quick-poe 1/2
switch(config)# no power-over-ethernet quick-poe 1/2
```

```
switch(config-if)# power-over-ethernet quick-poe 1/1
PoE must be enabled on all interfaces before enabling Quick PoE
```

```
switch(config-if)# power-over-ethernet quick-poe 1/3
All interfaces must use the default assigned class before enabling Quick PoE
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

power-over-ethernet threshold

```
power-over-ethernet threshold <PERCENTAGE>
no power-over-ethernet threshold <PERCENTAGE>
```

Description

Sets the threshold at which the system will send an excess power consumption notification trap. Default value is 80 percentage.

The **no** form of this command resets the action to default.

Parameter	Description
<PERCENTAGE>	Excess power consumption trap threshold. Range 1-99.

Examples

Setting the power-over-ethernet threshold:

```
switch(config)# power-over-ethernet threshold 75
```

Resetting the power-over-ethernet threshold to default:

```
switch(config-if)# no power-over-ethernet threshold 75
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

power-over-ethernet trap

```
power-over-ethernet trap
no power-over-ethernet trap
```

Description

This command enables/disables the SNMP trap generation for PoE related events at system level. PoE trap generation is enabled by default.

The **no** form of this command resets the priority to default PoE priority "low".

Examples

Enabling SNMP trap generation for PoE:

```
switch(config)# power-over-ethernet trap
```

Disabling SNMP trap generation for PoE:

```
switch(config-if)# no power-over-ethernet trap
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show lldp local

`show lldp local-device [<INTERFACE-ID>]`

Description

Displays information advertised by the switch if the LLDP feature is enabled by user.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: **member/slot/port**

Examples

On the 6400 Switch Series, interface identification differs.

Showing LLDP local device:

```
switch# show lldp local-device 1/1/10
Local Port Data
===============

Port-ID             : 1/1/10
Port-Desc           : "1/1/10"
Port VLAN ID        : 0

PoE Plus Information
PoE Device Type     : Type 2 PSE
Power Source        : Primary
Power Priority      : low
PSE Allocated Power: 25.0 W
PD Requested Power : 25.0 W
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show lldp neighbor

`show lldp neighbor [<INTERFACE-ID>]`

Description

Displays detailed information about a particular neighbor connected to a particular interface.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: **member/slot/port**

Examples

On the 6400 Switch Series, interface identification differs.

Showing LLDP neighbor information when there is only one neighbor:

```
switch# show lldp neighbor-info 1/1/10

Port                             : 1/1/10
Neighbor Entries                 : 1
Neighbor Entries Deleted         : 0
Neighbor Entries Dropped         : 0
Neighbor Entries Aged-Out        : 0
Neighbor Chassis-Name            : 84:d4:7e:ce:5d:68
Neighbor Chassis-Description     : ArubaOS (MODEL: 325), Version Aruba IAP
Neighbor Chassis-ID              : 84:d4:7e:ce:5d:68
Neighbor Management-Address      : 169.254.41.250
Chassis Capabilities Available : Bridge, WLAN
Chassis Capabilities Enabled     :
```

```
Neighbor Port-ID                : 84:d4:7e:ce:5d:68
Neighbor Port-Desc              : eth0
TTL                             : 120
Neighbor Port VLAN ID           :
Neighbor PoEplus information    : DOT3
Neighbor Device Type            : TYPE2 PD
Neighbor Power Priority         : Unkown
Neighbor Power Source           : Primary
Neighbor Power Requested        : 25.0 W
Neighbor Power Allocated        : 0.0 W
Neighbor Power Supported        : No
Neighbor Power Enabled          : No
Neighbor Power Class            : 5
Neighbor Power Paircontrol      : No
Neighbor Power Pairs            : SIGNAL
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show power-over-ethernet

6300 Switch Series:

```
show power-over-ethernet [member <MEMBER-ID>] [brief]
```

6400 Switch Series:

```
show power-over-ethernet [<MODULE-ID>] [brief]
```

6300, 6400 Switch Series:

```
show power-over-ethernet [<IFRANGE>] [brief]
```

Description

Displays the status information of the full system. Displays the brief status of all port or given port if parameter brief is used. Displays the detailed status of given port.

Parameter	Description
<MODULE-ID>	Displays detailed status for the given module.
<IFRANGE>	Port identifier range.

Parameter	Description
<IFNAME>	Display the detailed status of given port.
`brief`	Display the brief status of all ports or the given port.

Examples

Showing sample output for show power-over-ethernet on standalone box with VSF capabiity:

```
switch# show power-over-ethernet

System Power Status for member 1

  Configured  Power Status     : No redundancy
  Operational Power Status     : No redundancy
  Total Available Power        : 740 W
  Total Failover Pwr Avl       :   0 W
  Total Redundancy Power       :   0 W
  Total Power Drawn            :   0 W +/- 6W
  Total Power Reserved         :   0 W
  Total Remaining Power        : 740 W
  Trap Threshold               : 80 %
  Trap Enabled                 : Yes
  Always-on PoE Enabled        : 1/1
  Quick PoE Enabled            : None


Internal Power
        Total Power
  PS    (Watts)        Status
  ----- -------------  ---------------------
  1     0              Absent
  2     740            Ok

System Power Status for member 2

  Configured  Power Status     : No redundancy
  Operational Power Status     : No redundancy
  Total Available Power        : 600 W
  Total Failover Pwr Avl       :   0 W
  Total Redundancy Power       :   0 W
  Total Power Drawn            :   0 W +/- 6W
  Total Power Reserved         :   0 W
  Total Remaining Power        : 600 W
  Trap Threshold               : 80 %
  Trap Enabled                 : Yes
  Always-on PoE Enabled        : None
  Quick PoE Enabled            : None


Internal Power
        Total Power
  PS    (Watts)        Status
  ----- -------------  ---------------------
  1     0              Absent
  2     600            Ok
```

Showing sample output for power-over-ethernet member:

```
switch# show power-over-ethernet member 1

System Power Status for member 1

  Configured  Power Status     : No redundancy
  Operational Power Status     : No redundancy
  Total Available Power        : 740 W
  Total Failover Pwr Avl       :   0 W
  Total Redundancy Power       :   0 W
  Total Power Drawn            :   0 W +/- 6W
  Total Power Reserved         :   0 W
  Total Remaining Power        : 740 W
  Trap Threshold               : 80 %
  Trap Enabled                 : No
  Always-on PoE Enabled        : 1/1
  Quick PoE Enabled            : 1/1

Internal Power
        Total Power
  PS    (Watts)        Status
  ----- -------------  ---------------------
  1     0              Absent
  2     740            Ok
```

Showing sample output for power-over-ethernet brief in a VSF stack:

```
switch# show power-over-ethernet brief

Status and Configuration Information for PoE

  Member 1 Power Status
    Available: 370 W  Reserved: 55.60 W  Remaining: 314.40 W
    Always-on PoE Enabled: 1/1
    Quick PoE Enabled: None

PoE      Pwr Power    Pre-std Alloc PSE Pwr PD Pwr PoE Port     PD     Cls Type
Port     En  Priority Detect  Act   Rsrvd   Draw   Status       Sign
-------  --- ------   ------- ----- ------  ------ ---------    -----  --- ----
1/1/1    Yes Low      Off     Class  0.0 W   0.0 W Denied       None   4   2
1/1/2    Yes Critical Off     Usage  1.6 W   1.5 W Delivering*  Single 0   1
1/1/3    Yes High     Off     Class 54.0 W  25.5 W Delivering*^ Dual   1/3 3
1/1/4    No  Low      On      Usage  0.0 W   0.0 W Disabled     None   N/A N/A

  Member 2 Power Status
    Available: 600 W  Reserved: 0.00 W  Remaining: 600 W
    Always-on PoE Enabled: None
    Quick PoE Enabled: None

PoE      Pwr Power    Pre-std Alloc PSE Pwr PD Pwr PoE Port     PD     Cls Type
Port     En  Priority Detect  Act   Rsrvd   Draw   Status       Sign
-------  --- ------   ------- ----- ------  ------ ---------    -----  --- ----
2/1/1    Yes Low      Off     Class  0.0 W   0.0 W Searching    None   N/A  N/A
2/1/2    Yes Critical Off     Usage  0.0 W   0.0 W Searching    None   N/A  N/A
2/1/3    Yes High     Off     Class  0.0 W   0.0 W Searching    None   N/A  N/A
2/1/4    No  Low      On      Usage  0.0 W   0.0 W Disabled     None   N/A  N/A

*This port may go down in the event of a PSU failure.
^This port is power demoted due to user config or power availabilty.
```

Showing sample output for power-over-ethernet brief for a Chassis system:

```
switch# show power-over-ethernet brief

Status and Configuration Information for PoE

  Power Status
    Available: 370 W  Reserved: 55.60 W  Remaining: 314.40 W
    Always-on PoE Enabled: 1/1,1/3,1/4,1/7
    Quick PoE Enabled: None

PoE      Pwr Power    Pre-std Alloc PSE Pwr PD Pwr PoE Port     PD     Cls Type
Port     En  Priority Detect  Act   Rsrvd   Draw   Status       Sign
-------  --- ------   ------- ----- ------  ------ ---------    -----  --- ----
1/1/1    Yes Low      Off     Class  0.0 W   0.0 W Denied       None   4   2
1/1/2    Yes Critical Off     Usage  1.6 W   1.5 W Delivering*  Single 0   1
1/1/3    Yes High     Off     Class 54.0 W  25.5 W Delivering^  Dual   1/3 3
1/1/4    No  Low      On      Usage  0.0 W   0.0 W Disabled     None   N/A N/A

*This port may go down in the event of a PSU failure.
^This port is power demoted due to user config or power availabilty.
```

Showing sample output for power-over-ethernet brief per-port:

```
switch# show power-over-ethernet 1/1/1 brief

Status and Configuration Information for port 1/1/1

  Member 1Power Status
    Available: 370 W  Reserved: 55.60 W  Remaining: 314.40 W
    Always-on PoE Enabled: 1/1
PoE      Pwr Power    Pre-std Alloc PSE Pwr PD Pwr PoE Port     PD     Cls Type
Port     En  Priority Detect  Act   Rsrvd   Draw   Status       Sign
-------  --- ------   ------- ----- ------  ------ ---------    -----  --- ----
1/1/1    Yes Low      Off     Class  0.0 W   0.0 W Denied       None   4   2
```

Showing sample output for power-over-ethernet brief for interface range:

For 6300 Switch series:

```
switch# show power-over-ethernet 1/1/1-1/1/2 brief

Status and Configuration Information for port 1/1/1-1/1/2

  Member 1Power Status
    Available: 370 W  Reserved: 55.60 W  Remaining: 314.40 W
    Always-on PoE Enabled: 1/1
    Quick PoE Enabled: None
PoE      Pwr Power    Pre-std Alloc PSE Pwr PD Pwr PoE Port     PD     Cls Type
Port     En  Priority Detect  Act   Rsrvd   Draw   Status       Sign
-------  --- ------   ------- ----- ------  ------ ---------    -----  --- ----
1/1/1    Yes Low      Off     Class  0.0 W   0.0 W Denied       None   4   2
1/1/2    Yes Critical Off     Usage  1.6 W   1.5 W Delivering*  Single 0   1
```

For 6400 Switch series:

```
switch# show power-over-ethernet 1/1/1-1/1/2 brief

Status and Configuration Information for port 1/1/1-1/1/2

```

```
    Power Status
    Available: 360 W  Reserved: 0.00 W  Remaining: 360.00 W
    Always-on PoE Enabled: 1/1
    Quick PoE Enabled: None
PoE      Pwr Power    Pre-std Alloc PSE Pwr PD Pwr PoE Port      PD     Cls Type
Port     En  Priority Detect  Act   Rsrvd   Draw   Status        Sign
-------  --- ------   ------- ----- ------  ------ ---------     -----  --- ----
1/1/1    Yes Low      Off     Usage  0.0 W   0.0 W Searching     N/A    N/A N/A
1/1/2    Yes Low      Off     Usage  0.6 W   0.0 W Searching     N/A    N/A N/A
```

Showing sample output for power-over-ethernet for a missing line card:

```
switch# show power-over-ethernet 1/3 brief

Module 1/3 is not physically present.
```

Showing sample output for power-over-ethernet brief for a missing member:

```
switch# show power-over-ethernet member 3 brief

Member 3 is not physically present.
```

Showing sample output for power-over-ethernet port when physical interface is not present:

```
switch# show power-over-ethernet 2/1/1

Interface 2/1/1 is not present.
```

Showing power-over-ethernet port with dual signature PD connected:

```
switch# show power-over-ethernet 1/1/1

 Status and Configuration Information for port 1/1/1*

  Power Enable           : Yes          PD signature             : Dual
  PoE PairA Status       : Delivering   PoE PairB Status         : Delivering
  Alloc-by Configured    : Class        Alloc-by Actual          : Class
  User Profile Priority  : High         Port Config Priority     : Low
  Port Priority          : High         Pre-std Detect           : Disabled
  PD Type                : Type3        User Assigned Class      : Class6
  PairA Requested Class  : Class1       PairB Requested Class    : Class4
  PairA Assigned Class   : Class1       PairB Assigned  Class    : Class4
  Fault Status PairA     : None         Fault Status PairB       : None
  PD Class Override      : Disabled     Power Pairs Configured   : alt-a
                                        Power Pairs Applied      : alt-a-and-
alt-b

 PoE Counter Information

  Over Current Cnt PairA : 0            MPS Absent Cnt PairA     : 0
  Power Denied Cnt PairA : 0            Short Cnt PairA          : 0
  Over Current Cnt PairB : 0            MPS Absent Cnt PairB     : 0
  Power Denied Cnt PairB : 0            Short Cnt PairB          : 0
 Power Information

  PSE Voltage            : 56.3 V         PSE Reserved power       : 34.0 W
  PD Current Draw        :  4.1 A         PD Power Draw            : 24.6 W
  PD Average Power Draw  : 24.0 W         PD Peak Power Draw       : 25.1 W

 LLDP Information

  MED Override                       : Enabled
  MED Priority                       : High
  PSE TLV Configured                 : dot3, med
  PSE TLV Sent Type                  : dot3-ext
  PD TLV Sent Type                   : med, dot3-ext
  DS PSE Allocated Power Value Alt A :  2.5 W
  DS PD Requested Power Value Mode A :  2.5 W
  DS PSE Allocated Power Value Alt B : 25.0 W
  DS PD Requested Power Value Mode B : 25.0 W
```

Showing power-over-ethernet port with single signature PD connected:

```
switch# show power-over-ethernet 1/1/1


 Status and Configuration Information for port 1/1/9*

  Power Enable           : Yes            PD signature           : None
  PoE Port  Status       : Delivering     PD Type                : Type3
  Alloc-by Configured    : Usage          Alloc-by Actual        : Usage
  User Profile Priority  : High           Port Config Priority   : Low
  Port Priority          : High           Pre-std Detect         : Disabled
  PD Requested Class     : Class1         PSE Assigned Class     : Class1
  Fault Status           : None           User set Assigned Class : Class6
  PD Class Override      : Disabled       Power Pairs Configured  : alt-a-and-alt-
b
                                          Power Pairs Applied     : alt-a-and-alt-
b

 PoE Counter Information

  Over Current Cnt       : 0              MPS Absent Cnt           : 0
  Power Denied Cnt       : 0              Short Cnt                : 0

 Power Information

  PSE Voltage            : 56.3 V         PSE Reserved power       :  8.6 W
  PD Current Draw        :  1.1 A         PD Power Draw            :  8.6 W
  PD Average Power Draw  :  8.0 W         PD Peak Power Draw       :  9.1 W

 LLDP Information

  LLDP Detect                 : Disabled
  PSE TLV Configured          : N/A
  PSE TLV Sent Type           : N/A
  PD TLV Sent Type            : N/A
  PSE Allocated Power Value :  0.0 W
  PD Requested Power Value  :  0.0 W
```

Showing power-over-ethernet for a port range:

```
switch# show power-over-ethernet 1/1/3-1/1/4


 Status and Configuration Information for port 1/1/3

  Power Enable           : Yes            PD signature            : None
  PoE Port  Status       : Delivering     PD Type                 : Type3
  Alloc-by Config        : Usage          Alloc-by Actual         : Usage
  User Profile Priority  : High           Port Config Priority    : Low
  Port Priority          : High           Pre-std Detect          : Disabled
  PD Requested Class     : Class1         PSE Assigned Class      : Class1
  Fault Status           : None           User set Assigned Class : Class6
  PD Class Override      : Disabled       Power Pairs Configured  : alt-a-and-alt-
b
                                          Power Pairs Applied     : alt-a-and-alt-
b

 PoE Counter Information

  Over Current Cnt       : 0              MPS Absent Cnt           : 0
  Power Denied Cnt       : 0              Short Cnt                : 0

 Power Information

  PSE Voltage            : 56.3 V         PSE Reserved power       :  8.6 W
  PD Current Draw        :  1.1 A         PD Power Draw            :  8.6 W
  PD Average Power Draw  :  8.0 W         PD Peak Power Draw       :  9.1 W

 LLDP Information

  LLDP Detect               : Disabled
  PSE TLV Configured        : N/A
  PSE TLV Sent Type         : N/A
  PD TLV Sent Type          : N/A
  PSE Allocated Power Value :  0.0 W
  PD Requested Power Value  :  0.0 W

 Status and Configuration Information for port 1/1/4*

  Power Enable           : Yes            PD signature            : None
  PoE Port  Status       : Delivering     PD Type                 : Type3
  Alloc-by Config        : Usage          Alloc-by Actual         : Usage
  User Profile Priority  : High           Port Config Priority    : Low
  Port Priority          : High           Pre-std Detect          : Disabled
  PD Requested Class     : Class1         PSE Assigned Class      : Class1
  Fault Status           : None           User set Assigned Class : Class6
  PD Class Override      : Disabled       Power Pairs Configured  : alt-a
                                          Power Pairs Applied     : alt-a

 PoE Counter Information

  Over Current Cnt       : 0              MPS Absent Cnt           : 0
  Power Denied Cnt       : 0              Short Cnt                : 0

 Power Information

  PSE Voltage            : 56.3 V         PSE Reserved power       :  4.3 W
  PD Current Draw        :  1.1 A         PD Power Draw            :  4.3 W
  PD Average Power Draw  :  4.0 W         PD Peak Power Draw       :  4.3 W

 LLDP Information
LLDP Detect                 : Disabled
PSE TLV Configured          : N/A
PSE TLV Sent Type           : N/A
PD TLV Sent Type            : N/A
PSE Allocated Power Value :  0.0 W
PD Requested Power Value  :  0.0 W
```

For more information on features that use this command, refer to the Monitoring Guide for your switch model.

Command History

Release	Modification
10.09	Added power-pairs configuration in the **show power-over-ethernet <IFRANGE>** output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 114

Port access 802.1X authentication commands

aaa authentication port-access dot1x authenticator

```
aaa authentication port-access dot1x authenticator {enable | disable}
no aaa authentication port-access dot1x authenticator {enable | disable}
```

Description

Enables or disables 802.1X authentication globally or at the port-level.

The **no** form of the command deletes global 802.1X configuration details and disables 802.1X authentication.

Examples

Enabling 802.1X authentication globally:

```
switch(config)# aaa authentication port-access dot1x authenticator enable
```

Disabling 802.1X authentication globally:

```
switch(config)# aaa authentication port-access dot1x authenticator disable
```

Deleting and disabling global 802.1X authentication:

```
switch(config)# no aaa authentication port-access dot1x authenticator
```

Enabling 802.1X authentication on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator enable
```

Disabling 802.1X authentication on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator disable
```

Deleting and disabling 802.1X authentication configuration on a port:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator auth-method

```
aaa authentication port-access dot1x authenticator auth-method eap-radius
no aaa authentication port-access dot1x authenticator auth-method eap-radius
```

Description

Configures the authentication mechanism used to control access to the network. The configured authentication method will be used to authenticate 802.1X clients.

The **no** form of the command resets the authentication mechanism to the default, **eap-radius**.

Parameter	Description
`eap-radius`	Specifies the EAP RADIUS as the 802.1X authentication method.

Examples

Enabling the EAP RADIUS 802.1X authentication method on the switch:

```
switch(config)# aaa authentication port-access dot1x authenticator auth-method
eap-radius
```

Resetting the EAP RADIUS 802.1X authentication method on the switch:

```
switch(config)# no aaa authentication port-access dot1x authenticator auth-method
eap-radius
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator cached-reauth

```
aaa authentication port-access dot1x authenticator cached-reauth
no aaa authentication port-access dot1x authenticator cached-reauth
```

Description

Enables cached reauthentication on a port. Cached reauthentication allows 802.1X reauthentications to succeed when the RADIUS server is unavailable. Users already authenticated retain their currently assigned RADIUS attributes.

The **no** form of the command disables the cached reauthentication on a port.

Examples

Enabling cached reauthentication on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator cached-
reauth
```

Disabling cached reauthentication on a port:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator cached-
reauth
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator cached-reauth-period

```
aaa authentication port-access dot1x authenticator cached-reauth-period <PERIOD>
```

```
no aaa authentication port-access dot1x authenticator cached-reauth-period
```

Description

Configures the period during which an authenticated client, which has failed to reauthenticate because the RADIUS server is unreachable, remains authenticated.

The **no** form of the command resets the cached reauthentication period to the default, 30 seconds.

Parameter	Description
<PERIOD>	Specifies the cached reauthentication period (in seconds). Default: 3600. Range: 1 to 4294967295.

Examples

Configuring the cached reauthentication period on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator cached-
reauth-period 300
```

Resetting the cached reauthentication period to the default value:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator cached-
reauth-period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator discovery-period

```
aaa authentication port-access dot1x authenticator discovery-period <PERIOD>
no aaa authentication port-access dot1x authenticator discovery-period
```

Description

Configures the period the port waits to retransmit the next EAPOL request identity frame on an 802.1X enabled port that has no authenticated clients.

The **no** form of the command resets the discovery period to the default, 30 seconds.

Parameter	Description
<PERIOD>	Specifies the discovery period (in seconds). Default: 30. Range: 1 to 65535.

Examples

Configuring the discovery period on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator discovery-
period 120
```

Resetting the discovery period to the default value:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator
discovery-period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator eap-tls-fragment

```
aaa authentication port-access dot1x authenticator eap-tls-fragment towards-server <max-
fragment-size>
no aaa authentication port-access dot1x authenticator eap-tls-fragment towards-server
```

Description

Configure the maximum size in bytes of an EAP-TLS fragment encoded in a single RADIUS request packet. The **no** form of the command resets the size to the default value of 3072 bytes.

Examples

Setting the EAP-TLS fragment size for RADIUS request to 1024 bytes:

```
switch(config)# aaa authentication port-access dot1x authenticator eap-tls-fragment towards-server 1024
```

Resetting EAP-TLS fragment size back to the default value of 3072 bytes

```
switch(config-if)# no aaa authentication port-access dot1x authenticator eap-tls-fragment towards-server
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator eapol-timeout

```
aaa authentication port-access dot1x authenticator eapol-timeout <EAPOL-TIMEOUT>
no aaa authentication port-access dot1x authenticator eapol-timeout
```

Description

Configure the period the switch waits for a response from a client before retransmitting an EAPOL PDU. If the value is **0**, the time period is calculated as per RFC 2988.

As per RFC 2988 2.1: Before Round-Trip Time (RTT) measurement, set Retransmission Timeout (RTO) to 3 seconds for initial retransmission and then double the RTO to provide back off as per section 5.5. Limit the maximum RTO (RTOmax) to 20 seconds as per section 4.3 of RFC 3748.

The **no** form of the command resets the timeout period to the default.

Parameter	Description
<EAPOL-TIMEOUT>	Specifies the EAPOL timeout period (in seconds). Range: 1 to 65535.

Examples

Configuring EAPOL timeout on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator eapol-
timeout 120
```

Resetting the EAPOL timeout to the default value:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator eapol-
timeout
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator initial-auth-response-timeout

```
aaa authentication port-access dot1x authenticator
    initial-auth-response-timeout <TIMEOUT>
no aaa authentication port-access dot1x authenticator
    initial-auth-response-timeout [<TIMEOUT>]
```

Description

Configures the period of time (in seconds) the switch waits for the first EAPOL frame from a client before deeming the client to be incapable of 802.1X and therefore attempting the next authentication method, if any. The default is for this timeout to be disabled.

The **no** form of this command disables the timeout.

Parameter	Description
<TIMEOUT>	Specifies the timeout period (in seconds). Range: 1 to 65535.

Examples

Setting a 30 second timeout:

```
switch(config-if)# aaa authentication port-access dot1x authenticator
   initial-auth-response-timeout 30
```

Disabling the timeout:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator
   initial-auth-response-timeout
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator macsec

```
aaa authentication port-access dot1x authenticator macsec
no aaa authentication port-access dot1x authenticator macsec
```

Description

Enables the switch to provision a MACsec channel dynamically when the 802.1X client is authenticated using an EAP method that supports mutual authentication. MACsec is supported in device mode and in client mode with a client limit of one on MACsec-capable ports.

If a MACsec policy is not associated with the role applied to the client on the port with MACsec enabled, a MACsec channel will not be established and the port will be blocked on the data-plane.

The **no** form of the command disables MACsec using EAP on the port.

Examples

Enabling MACsec using EAP on a port:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator macsec
OR
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator
switch(config-if-dot1x-auth)# macsec
```

Disabling MACsec using EAP on a port:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access dot1x authenticator macsec
OR
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator
switch(config-if-dot1x-auth)# no macsec
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if` `config-if-dot1x-auth`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator max-eapol-requests

```
aaa authentication port-access dot1x authenticator max-eapol-requests <MAX-EAPOL-REQUESTS>
no aaa authentication port-access dot1x authenticator max-eapol-requests
```

Description

Configures the number of EAPOL requests to send to a supplicant that must time out before authentication fails and the authentication session ends.

The **no** form of the command resets the maximum number of EAPOL requests to the default, 5.

Parameter	Description
<MAX-EAPOL-REQUESTS>	Specifies the maximum number of EAPOL requests. Default: 5. Range: 1 to 10.

Examples

Configuring maximum EAPOL requests on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator max-eapol-requests 3
```

Resetting the maximum EAPOL requests on a port to default:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator max-
eapol-requests
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator max-retries

```
aaa authentication port-access dot1x authenticator max-retries <max-retries>
no aaa authentication port-access dot1x authenticator max-retries
```

Description

Configures the maximum number of retries that the switch attempts to authenticate a client on a port before marking the client as unauthenticated.

The **no** form of the command resets the maximum number of retries to the default, 2.

Parameter	Description
<max-retries>	Indicates the number of authentication attempts. Default: 2. Range: 1 to 10.

Examples

Configuring maximum authentication attempts on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator max-retries
5
```

Resetting the maximum authentication attempts on a port to default:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator max-
retries
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator mka cak-length

```
aaa authentication port-access dot1x authenticator mka cak-length {16|32}
no aaa authentication port-access dot1x authenticator mka cak-length {16|32}
```

Description

Configures the length of the Connectivity Association Key (CAK) to generate for EAP based MACsec.

The **no** form of this command resets the length to the default value of 32 bytes.

Parameter	Description
`{16|32}`	Specifies the CAK length. Default: 32.

Examples

Configuring the CAK length to 16 bytes:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator mka cak-
length 16
OR
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator
switch(config-if-dot1x-auth)# mka cak-length 16
```

Configuring the CAK length to default:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access dot1x authenticator mka cak-
length
OR
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator
switch(config-if-dot1x-auth)# no mka cak-length
```

```
OR
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator
switch(config-if-dot1x-auth)# no mka cak-length 16
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if` `config-if-dot1x-auth`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator quiet-period

```
aaa authentication port-access dot1x authenticator quiet-period <PERIOD>
no aaa authentication port-access dot1x authenticator quiet-period
```

Description

Configures the period during which the port does not try to acquire a supplicant. This period begins after the last authentication attempt, authorized by the maximum retries parameter, fails.

You can configure the number of maximum retries with the **aaa authentication port-access dot1x authenticator max-retries** command.

The **no** form of the command resets the quiet period to the default, 60 seconds.

Parameter	Description
<PERIOD>	Specifies the quiet period (in seconds). Default: 60. Range: 0 to 65535.

Examples

Configuring quiet period on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator quiet-period
100
```

Resetting the quiet period on a port to default:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator quiet-period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator radius server-group

```
aaa authentication port-access dot1x authenticator radius server-group <GROUP-NAME>
no aaa authentication port-access dot1x authenticator radius server-group <GROUP_NAME>
```

Description

Configures the switch to use an existing RADIUS server group for 802.1X authentication globally or for a particular port.

The **no** form of the command resets the server group to the default, **radius**.

When configured on a port, the **no** form of the command resets the server group on that port to the globally configured group. If no global RADIUS server group is configured, the **no** form of the command resets the configuration to the default group, **radius**.

When the RADIUS server group for 802.1X authentication is updated on a port, any existing clients on the port that were authenticated using the previous globally configured group will associate with the new group for the port during the next re-authentication cycle. Any new client that is onboarding on the port after the server group update will associate with the new group immediately.

Parameter	Description
<GROUP-NAME>	Specifies the name of the RADIUS server group.

Examples

Configuring the switch to use RADIUS server group **employee**:

```
switch(config)# aaa authentication port-access dot1x authenticator radius server-
group employee
```

Resetting RADIUS server group configuration to default:

```
switch(config)# no aaa authentication port-access dot1x authenticator radius
server-group
```

Configuring the RADIUS authentication server group on **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator
switch(config-if-dot1x-auth)# radius server-group group2
```

Resetting 802.1X RADIUS server group configuration on **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x authenticator
switch(config-if-dot1x-auth)# no radius server-group
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command is now configurable on a port
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-auth`
	`config-if-dot1x-auth`
		Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator reauth

```
aaa authentication port-access dot1x authenticator reauth
no aaa authentication port-access dot1x authenticator reauth
```

Description

Enables periodic reauthentication of authenticated clients on the port.

The **no** form of the command disables periodic reauthentication.

Examples

Enabling periodic reauthentication on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator reauth
```

Disabling periodic reauthentication on a port:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator reauth
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x authenticator reauth-period

```
aaa authentication port-access dot1x authenticator reauth-period <PERIOD>
no aaa authentication port-access dot1x authenticator reauth-period
```

Description

Configures the period after which the authenticated clients are reauthenticated on the port. You must enable reauthentication on the port before configuring the reauthentication period.

The **no** form of the command resets the reauthentication period to the default, 3600 seconds.

Parameter	Description
<PERIOD>	Specifies the reauthentication period (in seconds). Default: 3600. Range: 1 to 4294967295.

Examples

Configuring reauthentication period on a port:

```
switch(config-if)# aaa authentication port-access dot1x authenticator reauth-
period 100
```

Resetting the reauthentication period to the default value:

```
switch(config-if)# no aaa authentication port-access dot1x authenticator reauth-
period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

clear dot1x authenticator statistics interface

`clear dot1x authenticator statistics [interface <IF-NAME>]`

Description

Clears the 802.1X authentication statistics associated with the port and all the authenticator clients attached to this port.

If no interface is specified, the statistics is cleared for all 802.1X enabled ports.

Parameter	Description
<IF-NAME>	Specifies the interface name.

Examples

Clearing authentication statistics on a port:

```
switch# clear dot1x authenticator statistics interface 1/3/1
```

Clearing authentication statistics on all ports:

```
switch# clear dot1x authenticator statistics
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

show aaa authentication port-access dot1x authenticator interface client-status

```
show aaa authentication port-access dot1x authenticator interface {all|<IF-NAME>}
     client-status [mac <MAC-ADDRESS>]
```

Description

Shows information about active 802.1X authentication sessions. The output can be filtered by interface or MAC address.

Parameter	Description
`all`	Specifies all interfaces.
`<IF-NAME>`	Specifies the interface name.
`<MAC-ADDRESS>`	Specifies the client MAC address.

Examples

On the 6400 Switch Series, interface identification differs.

Showing client status information for all ports.

```
switch# show aaa authentication port-access dot1x authenticator interface all
client-status

Client  FE:04:D7:50:89:37, johndoe, 1/1/1
=========================================

  Authentication Details
  ----------------------
    Status                          : Authenticated
    Type                            : Pass-Through
    EAP-Method                      : MD5
    Time Since Last State Change    : 10s

  Authentication Statistics
  -------------------------
    Authentication                           : 0
    Authentication Timeout                   : 0
    EAP-Start While Authenticating           : 0
    EAP-Logoff While Authenticating          : 0
    Successful Authentication                : 0
    Failed Authentication                  : 0
    Re-Authentication                      : 0
    Successful Re-Authentication           : 0
    Failed Re-Authentication               : 0
    EAP-Start When Authenticated           : 0
    EAP-Logoff When Authenticated          : 0
    Re-Auths When Authenticated            : 0
    Cached Re-Authentication               : 0

Client  9A:B4:59:97:D0:7E, janedoe, 1/1/1
=========================================

  Authentication Details
  ----------------------
    Status                        : Authenticated
    Type                          : Pass-Through
    EAP-Method                    : TLS
    Time Since Last State Change  : 5s

  Authentication Statistics
  -------------------------
    Authentication                         : 0
    Authentication Timeout                 : 0
    EAP-Start While Authenticating         : 0
    EAP-Logoff While Authenticating        : 0
    Successful Authentication              : 0
    Failed Authentication                  : 0
    Re-Authentication                      : 0
    Successful Re-Authentication           : 0
    Failed Re-Authentication               : 0
    EAP-Start When Authenticated           : 0
    EAP-Logoff When Authenticated          : 0
    Re-Auths When Authenticated            : 0
    Cached Re-Authentication               : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authentication port-access dot1x authenticator interface port-statistics

```
show aaa authentication port-access dot1x authenticator interface {all|<IF-NAME>} port-
statistics
```

Description

Shows information about 802.1X ports. The output can be filtered by interface.

Parameter	Description
`all`	Specifies all interfaces.
`<IF-NAME>`	Specifies the interface name.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for all ports.

```
switch# show aaa authentication port-access dot1x authenticator interface all
port-statistics

Port 1/1/1
==========

  Client Details
  --------------
    Number of Clients                 : 1
    Number of Authenticated Clients   : 1
    Number of Unauthenticated Clients : 0
    Number of authenticating clients  : 0


  Statistics
  ----------
    EAPOL Frames Received                  : 4
    EAPOL Frames Transmitted               : 3
    EAPOL Start Frames Received            : 1
    EAPOL Logoff Frames Received           : 0
    EAPOL Response ID Frames Received      : 2
    EAPOL Response Frames Received         : 1
    EAPOL Request ID Frames Transmitted    : 2
    EAPOL Request Frames Transmitted       : 1
    EAPOL Invalid Frames Received          : 0
    EAPOL EAP Length Error Frames Received : 0
    EAPOL Last Received Frame Version      : 0
    EAPOL Last Received Frame Client MAC   : 0

Port 1/1/2
==========

  Client Details
  --------------
    Number of Clients                 : 1
    Number of Authenticated Clients   : 1
    Number of Unauthenticated Clients : 0

  Statistics
  ----------
    EAPOL Frames Received                  : 4
    EAPOL Frames Transmitted               : 3
    EAPOL Start Frames Received            : 1
    EAPOL Logoff Frames Received           : 0
    EAPOL Response ID Frames Received      : 2
    EAPOL Response Frames Received         : 1
    EAPOL Request ID Frames Transmitted    : 2
    EAPOL Request Frames Transmitted       : 1
    EAPOL Invalid Frames Received          : 0
    EAPOL EAP Length Error Frames Received : 0
    EAPOL Last Received Frame Version      : 0
    EAPOL Last Received Frame Client MAC   : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 115

Port access 802.1X supplicant commands

aaa authentication port-access dot1x supplicant (global)

`aaa authentication port-access dot1x supplicant`

Description

Enters the 802.1X supplicant global configuration context.

Example

Enter the 802.1X supplicant configuration context:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)#
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-dot1x-supp`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access dot1x supplicant (port)

`aaa authentication port-access dot1x supplicant`

Description

Enters the 802.1X supplicant port context.

The 802.1X supplicant is only supported on L2 physical interfaces that are not members of a LAG.

Example

Enter the 802.1X supplicant port context:

```
switch(config)# interface 1/1/1
switch(config-if)# no routing
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)#
```

When entering the context on a L3 port, an error message displays:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x supplicant
The operation is allowed only on a L2 physical interface.
```

When entering the context on a LAG, an error message displays:

```
switch(config)# interface lag 1
switch(config-if)# aaa authentication port-access dot1x supplicant
The operation is allowed only on a L2 physical interface.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-if`
	`config-dot1x-supp`
		Administrators or local user group members with execution rights for this command.

associate policy

```
associate policy <POLICY-NAME>
no associate policy <POLICY-NAME>
```

Description

Associates a supplicant policy with the port.

The **no** form of the command dissociates the policy from the port and reverts to the default policy.

If an 802.1X supplicant is enabled on the port without associating a policy or dissociating a policy from the port, it results in the port using the default policy.

Parameter	Description
<POLICY-NAME>	Specifies the name of the policy. (Maximum 32 characters).

Examples

Associating a supplicant policy with the port:

```
switch(config)# interface 1/1/1
switch(config)# no routing
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# associate policy CX_Policy
```

Removing the supplicant policy on the port:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# no associate policy
OR

switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# no associate policy CX_Policy
```

When the policy being associated does not exist:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# associate policy New_Supp_Policy
The policy does not exist.
```

When the policy being dissociated is not the one configured on the port:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# associate policy New_Supp_Policy
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

canned-eap-success

```
canned-eap-success
no canned-eap-success
```

Description

Configures the switch to accept an EAP success from the authenticator without going through the complete authentication cycle. Default: disabled.

The **no** form of the command resets it to the default.

Examples

Configuring the switch to accept a canned EAP success:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# canned-eap-success
```

Resetting the allow canned EAP success configuration to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)#policy CX_Policy
switch(config-dot1x-supp-policy)# no canned-eap-success
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

clear dot1x supplicant statistics

```
clear dot1x supplicant statistics [interface <IFRANGE>]
```

Description

Clears the 802.1X supplicant statistics associated with the interface. If no interface is specified, the statistics are cleared for all 802.1X supplicant-enabled interfaces.

Parameter	Description
<IFRANGE>	Specifies the range of VLAN interfaces for which the supplicant statistics are cleared.

Examples

Clearing authenticator statistics on a specific interface:

```
switch# clear dot1x supplicant statistics 1/1/1
```

Clearing authenticator statistics on all interfaces:

```
switch# clear dot1x supplicant statistics
```

Showing the message when the feature is not enabled on any interface of the system:

```
switch# clear dot1x supplicant statistics
802.1X supplicant is not configured.
```

Showing the message when the feature is not enabled on the interface:

```
switch# clear dot1x supplicant statistics 1/1/1
802.1X supplicant is not configured.
```

Showing the message when there are no 802.1X supplicants on the system:

```
switch# clear dot1x supplicant statistics
No 802.1X supplicants found.
```

Showing the message when there are no 802.1X supplicants on the interface:

```
switch# clear dot1x supplicant statistics 1/1/1
No 802.1X supplicants found.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

discovery-timeout

```
discovery-timeout <DISCOVERY-TIMEOUT>
no discovery-timeout <DISCOVERY-TIMEOUT>
```

Description

Configures the time period (in seconds) to wait for a potential 802.1X authenticator on the other end before considering the link to be non-802.1X-capable and opening the interface on the data-plane. On a timeout, the switch will not use the authentication result to determine the forwarding behavior of the interface until a link flap. If not set, the switch will wait for the 802.1X authentication cycle to complete before determining the forwarding state of the interface.

The **no** form of the command removes the configuration.

Parameter	Description
<DISCOVERY-TIMEOUT>	Specifies discovery timeout in seconds. Range: 0-300 seconds.

Examples

Configuring a discovery timeout of 15 seconds in the supplicant policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# discovery-timeout 15
```

Removing the discovery timeout from the policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp)# no discovery-timeout

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no discovery-timeout 15
```

When the value entered does not match the currently configured non-default value for EAPoL timeout, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# discovery-timeout 15
switch(config-dot1x-supp-policy)# no discovery-timeout 5
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

eap-identity

```
eap-identity identity <IDENTITY>
no eap-identity identity <IDENTITY>
eap-identity password {plaintext [<PLAINTEXT-PASSWORD>] | ciphertext <CIPHERTEXT-PASSWORD>}
no eap-identity password {plaintext [<PLAINTEXT-PASSWORD>] | ciphertext <CIPHERTEXT-PASSWORD>}
```

Description

Configures the EAP identity to use for authentication including an identity name and an optional password.

The **no** form of the command removes the configuration.

Parameter	Description
<IDENTITY>	Specifies the EAP identity name. Maximum: 64 characters.
<PLAINTEXT-PASSWORD>	Specifies the password associated with the EAP identity in plaintext. Maximum: 32 characters. Specifies the password without prompting. The password is visible as cleartext when entered but is encrypted thereafter. Command history does show the password as cleartext.
<CIPHERTEXT-PASSWORD>	Specifies a ciphertext password. No password prompts are provided and the ciphertext password is validated before the configuration is applied for the user. The variable *<CIPHERTEXT-PASSWORD>* is Base64 and is typically copied from another switch using the `show running-config` command output and then pasted into this command.

Parameter	Description
	NOTE: The administrator cannot construct ciphertext passwords themselves. The ciphertext is only created by an AOS-CX switch. The ciphertext is created by setting a password for a user with the `user` command. The ciphertext is available for copying from the `show running-config` output and pasting into the configuration on any other AOS-CX switch. The target switch must have the same export password (default or otherwise) as the source switch.

Examples

Configuring the EAP identity and password:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eap-identity identity John Doe
switch(config-dot1x-supp-policy)# eap-identity password plaintext johndoe

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eap-identity identity John Doe
switch(config-dot1x-supp-policy)# eap-identity password plaintext
Enter password: ******
Confirm password: ******

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eap-identity identity John Doe
switch(config-dot1x-supp-policy)# eap-identity password ciphertext
AQBapUwNK5Uf+r1vmhBIncQPw1YPVH0V1nYr7Yjm/bPn3bBVCgAAAHFKt8mcSv/A/g8=
```

Removing the EAP identity configuration:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp)# no eap-identity identity

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eap-identity identity John Doe
```

Removing the EAP identity password configuration:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eap-identity password

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eap-identity ciphertext
AQBapUwNK5Uf+r1vmhBIncQPw1YPVH0V1nYr7Yjm/bPn3bBVCgAAAHFKt8mcSv/A/g8=
```

When the EAP identity string is longer than 64 characters, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eap-identity identity This is a really long
string with more than sixty four characters in it
The EAP identity string is more than 64 characters long.
```

When the EAP identity password string is longer than 32 characters, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eap-identity password plaintext This is a
password with more than 32 characters
The password is more than 32 characters long.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

eapol-force-multicast

```
eapol-force-multicast
no eapol-force-multicast
```

Description

Configures the switch to send only multicast EAPoL packets irrespective of receiving unicast EAPoL packets from the authenticator. Default: disabled.

The **no** form of the command resets it to the default.

Examples

Configuring the switch to always send EAPoL multicast packets:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eapol-force-multicast
```

Resetting the EAPoL force multicast setting to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eapol-force-multicast
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

eapol-method

```
eapol-method {eap-tls | eap-md5}
no eapol-method {eap-tls | eap-md5}
```

Description

Configures the Extensible Authentication Protocol (EAP) method to use for authentication.

The **no** form of the command resets it to the default. The default is EAP-TLS.

Parameter	Description
`eapol-method`	Specifies the EAPoL method to use for authentication. Default: eap-tls.
`eap-tls`	Specifies the EAP method as EAP with TLS (EAP with transport layer security)
`eap-md5`	Specifies the EAP method as EAP with MD5 digest.

Examples

Configuring the EAP method as EAP-MD5:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eap-method eap-md5
```

Resetting the EAP method to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp)# no eap-method

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eap-method eap-md5
```

When the value entered does not match the currently configured non-default value for EAP method, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eap-method eap-md5
switch(config-dot1x-supp-policy)# no eap-method eap-tls
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

eapol-protocol-version

```
eapol-protocol-version
no eapol-protocol-version
```

Description

Configures the EAPoL protocol version to use in EAPoL frames transmitted by the supplicant.

The **no** form of the command resets it to the default.

When the EAPoL protocol version is modified while the policy is in use on one or more ports, all the supplicant sessions on such ports are restarted.

Parameter	Description
protocol-version	Required. Specifies the protocol-version. Options: 2 or 3. Default: 3.

Examples

Configuring the EAPoL protocol version as 2 in the supplicant policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eapol-protocol-version 2
```

Reset the EAPoL protocol version to the default value:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp)# no eapol-protocol-version

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eapol-protocol-version 2
```

When the value entered does not match the currently configured non-default value for EAPoL protocol version, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eapol-protocol-version 2
switch(config-dot1x-supp-policy)# no eapol-protocol-version 3
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

eapol-source-mac

```
eapol-source-mac (interface-mac | system-mac)
no eapol-source-mac (interface-mac | system-mac)
```

Description

Configures the source MAC address to use in the EAPoL frames transmitted by the 802.1X supplicant. The default is interface MAC address.

The **no** form of the command resets to its default EAPoL source MAC value.

Parameter	Description
`interface-mac`	Specifies the interface MAC address.
`system-mac`	Specifies the system MAC address.

Examples

Configuring the EAPoL source MAC as system MAC address:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eapol-source-mac system-mac
```

Resetting the EAPoL source MAC to its default address:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eapol-source-mac system-mac
```

Removing the source MAC address that is not configured for EAPoL source MAC:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eapol-source-mac system-mac
switch(config-dot1x-supp-policy)# no eapol-source-mac interface-mac
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switches.

Command Information

Platforms	Command context	Authority

6300	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

eapol-timeout

```
eapol-timeout <EAPOL-TIMEOUT>
no eapol-timeout <EAPOL-TIMEOUT>
```

Description

Configures the time period (in seconds) to wait for a response from an authenticator before reattempting authentication.

The **no** form of the command resets it to the default.

Parameter	Description
<EAPOL-TIMEOUT>	Specifies EAPoL timeout in seconds. Default: 30 seconds.

Examples

Configuring an EAPoL timeout of 10 seconds in the supplicant policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eapol-timeout 10
```

Resetting the EAPoL timeout to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp)# no eapol-timeout

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no eapol-timeout 10
```

When the value entered does not match the currently configured non-default value for EAPoL timeout, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# eapol-timeout 10
switch(config-dot1x-supp-policy)# no eapol-timeout 5
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	config config-dot1x-supp config-dot1x-supp-policy	Administrators or local user group members with execution rights for this command.

enable

```
enable
no enable
```

Description

Enables the 802.1X supplicant on the port. By default, the 802.1X supplicant is disabled on the port.

The **no** form of the command disables the 802.1X supplicant on the port.

Example

Enable the 802.1X supplicant on the port:

```
switch(config)# interface 1/1/1
switch(config)# no routing
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# enable
```

Disable the 802.1X supplicant on the port:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# no enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-dot1x-supp`	Administrators or local user group members with execution rights for this command.

enable

```
enable
no enable
```

Description

Enables the 802.1X supplicant on the system. By default, 802.1X supplicant is disabled on the system.

The **no** form of the command disables the 802.1X supplicant on the system.

Example

Enable the 802.1X supplicant on the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# enable
```

Disable the 802.1X supplicant on the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# no enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-dot1x-supp`	Administrators or local user group members with execution rights for this command.

fail-mode

```
fail-mode [fail-closed | fail-open]
no fail-mode [fail-closed | fail-open]
```

Description

Configures the forwarding behavior of the when the 802.1X authentication fails. Default: fail-open.

The **no** form of the command resets it to the default.

Examples

Configuring the fail mode as fail-closed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# fail-mode fail-closed
```

Resetting the fail mode to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)#policy CX_Policy
switch(config-dot1x-supp-policy)# no fail-mode

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)#policy CX_Policy
switch(config-dot1x-supp-policy)# no fail-mode fail-closed
```

When the fail-mode value entered does not match the currently configured non-default value:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# fail-mode fail-closed
switch(config-dot1x-supp-policy)# no fail-mode fail-open
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

held-period

```
held-period <HELD-PERIOD>
no held-period <HELD-PERIOD>
```

Description

Configure the time period (in seconds) to wait after a failed authentication attempt before another attempt is permitted.

The **no** form of the command resets it to default.

Parameter	Description
<HELD-PERIOD>	Specifies the held period in seconds. Default: 60 seconds.

Usage

When the value entered does not match the currently configured non-default value for held-period, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# held-period 30
switch(config-dot1x-supp-policy)# held-period 50
The input value does not match the currently configured value.
```

Examples

Configuring a held period of 30 seconds in the supplicant policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# held-period 30
```

Resetting the held period to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp)# no held-period

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no held-period 30
```

When the value entered does not match the currently configured non-default value for held-period, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# held-period 30
switch(config-dot1x-supp-policy)# held-period 50
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

macsec

```
macsec
no macsec
```

Description

Enables the switch to provision a MACsec channel dynamically when the 802.1X supplicant is authenticated using an EAP method that supports mutual authentication. By default, MACsec is disabled on the port.

The **no** form of the command disables MACsec for an 802.1X supplicant on the port.

A MACsec policy must be associated with the supplicant policy attached to the port with MACsec enabled. Otherwise, a MACsec channel will not be established and the port will be blocked on the data plane.

Example

Enabling MACsec using EAP for an 802.1X supplicant on the port:

```
switch(config)# interface 1/1/1
switch(config)# no routing
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# macsec
```

Disabling MACsec using EAP for an 802.1X supplicant on the port:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# no macsec
```

Attempting to enable MACsec on a port that is not MACsec capable:

```
switch(config)# interface 1/1/10
switch(config)# no routing
switch(config-if)# aaa authentication port-access dot1x supplicant
switch(config-if-dot1x-supp)# macsec
MACsec is not supported on the interface.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if-dot1x-supp`	Administrators or local user group members with execution rights for this command.

macsec-policy

```
macsec-policy <POLICY-NAME>
no macsec-policy <POLICY-NAME>
```

Description

Associates a MACsec policy with a supplicant policy for the supplicant to use when the supplicant is running MACsec on a port.

The **no** form of the command disassociates the MACsec policy from the supplicant policy.

Parameter	Description
<POLICY-NAME>	Specifies the name of the MACsec policy. (Maximum 128 characters).

Examples

Associating a MACsec policy with the supplicant policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy Supp_Policy
switch(config-dot1x-supp-policy)# macsec-policy MSec_Policy1
```

Disassociating a MACsec policy from the supplicant policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy Supp_Policy
switch(config-dot1x-supp-policy)# no macsec-policy
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-dot1x-supp-policy`	Administrators or local user group members with execution rights for this command.

max-retries

```
max-retries <MAX-RETRIES>
no max-retries <MAX-RETRIES>
```

Description

Configures the maximum number of authentication attempts before authentication fails.

The **no** form of the command resets it to the default.

Parameter	Description
<MAX-RETRIES>	Specifies the maximum retry attempts allowed. Range: 1-5. Default: 2.

Examples

Configuring the maximum retries to 5 in the supplicant policy:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# max-retries 5
```

Resetting the max retries to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp)# no max-retries

OR
```

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no max-retries 5
```

When the value entered does not match the currently configured non-default value for max-retries, the following message is displayed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# max-retries 5
switch(config-dot1x-supp-policy)# max-retries 3
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

mka cak-length

```
mka cak-length {16|32}
no mka cak-length {16|32}
```

Description

Configures the length of the Connectivity Association Key (CAK) to generate for EAP based MACsec.

The **no** form of this command resets it to the default length of 32 bytes.

Parameter	Description
`{16|32}`	Specifies the CAK length. Default: 32.

Examples

Configuring the CAK length to 16 bytes:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# mka cak-length 16
```

Configuring the CAK length to default:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no mka cak-length
OR
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no mka cak-length 16
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 switch series.

Command Information

Platforms	Command context	Authority
6300	`config-dot1x-supp` `config-dot1x-supp-policy`	Administrators or local user group members with execution rights for this command.

policy (supplicant)

```
policy <POLICY-NAME>
no policy <POLICY-NAME>
```

Description

Creates an 802.1X supplicant policy on the system.

The **no** form of the command deletes the 802.1X supplicant policy on the system.

Parameter	Description
<POLICY-NAME>	Specifies the name of the policy. (Maximum 32 characters).

Usage

Configure an 802.1X supplicant policy on the system:

Examples

Configure an 802.1X supplicant policy on the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)#
```

Delete the 802.1X supplicant policy from the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# no policy CX_Policy
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

port-access dot1x supplicant restart

`port-access dot1x supplicant restart [interface <IFRANGE>]`

Description

Restarts the 802.1X supplicant on the specified interface. The current authentication state is discarded and the supplicant restarts the authentication process.

Parameter	Description
<IFRANGE>	Optional. Specifies the range of physical interfaces for which the supplicant is restarted.

Examples

Restarting the 802.1X supplicant on a specific interface:

```
switch# port-access dot1x supplicant restart interface 1/1/1
switch#
```

Restarting the 802.1X supplicant on all interfaces:

```
switch# port-access dot1x supplicant restart
switch#
```

Showing the message when the feature is not enabled on any interface of the system:

```
switch# port-access dot1x supplicant restart
802.1X supplicant is not configured.
```

Showing the message when the feature is not enabled on the given interface:

```
switch# port-access dot1x supplicant restart 1/1/1
802.1X supplicant is not configured.
```

Showing the message when there are no 802.1X supplicants on the system:

```
switch# port-access dot1x supplicant restart
No 802.1X supplicants found.
```

Showing the message when there are no 802.1X supplicants on the interface:

```
switch# port-access dot1x supplicant restart 1/1/1
No 802.1X supplicants found.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authentication port-access dot1x supplicant policy

```
show aaa authentication port-access dot1x supplicant policy <POLICY-NAME>
```

Description

Shows information about the 802.1X supplicant policies on the system.

Parameter	Description
<POLICY-NAME>	Specifies the name of the policy. (Maximum 32 characters).

Examples

Showing all 802.1X supplicant policies on the system:

```
switch# show aaa authentication port-access dot1x supplicant policy

802.1X Supplicant Policy Details

  Policy Name: default
  ----------------------------------------------------------------------------
  Type                       : Default
  EAP Method                 : EAP-TLS
  Held Period                : 60 seconds
  Maximum Retries            : 2
  EAPoL Timeout              : 30 seconds
  EAP Identity               : --
  EAP Identity Password      : --
  EAPoL Force Multicast      : False
  EAPoL Source MAC           : Interface-MAC
  EAPoL Protocol Version     : 3
  Canned EAP Success         : False
  Discovery Timeout          : --
  Start Mode                 : Start-Open
  Fail Mode                  : Fail-Open
  MKA CAK Length             : 32
  MACsec Policy              : --

  Policy Name: CX_Policy
  ----------------------------------------------------------------------------
  Type                       : Static
  EAP Method                 : EAP-MD5
  Held Period                : 30 seconds
  Maximum Retries            : 5
  EAPoL Timeout              : 10 seconds
  EAP Identity               : John Doe
  EAP Identity Password      :
QBapUwNK5Uf+r1vmhBIncQPw1YPVH0V1nYr7Yjm/bPn3bBVCgAAAHFKt8mcSv/A/g8=
  EAPoL Force Multicast      : True
  EAPoL Source MAC           : Interface-MAC
  EAPoL Protocol Version     : 2
  Canned EAP Success         : True
  Discovery Timeout          : 15 seconds
  Start Mode                 : Start-Closed
  Fail Mode                  : Fail-Closed
  MKA CAK Length             : 16
  MACsec Policy              : Aggregator-Connect
```

Showing a specific 802.1X supplicant policy:

```
switch# show aaa authentication port-access dot1x supplicant policy CX_Policy

802.1X Supplicant Policy Details

  Policy Name: CX_Policy
  ----------------------------------------------------------------------------
  Type                       : Static
  EAP Method                : EAP-MD5
  Held Period               : 30 seconds
  Maximum Retries           : 5
  EAPoL Timeout             : 10 seconds
  EAP Identity              : John Doe
  EAP Identity Password     :
AQBapUwNK5Uf+r1vmhBIncQPw1YPVH0V1nYr7Yjm/bPn3bBVCgAAAHFKt8mcSv/A/g8=
  EAPoL Force Multicast     : True
  EAPoL Source MAC          : Interface-MAC
  EAPoL Protocol Version    : 2
  Canned EAP Success        : True
  Discovery Timeout         : 15 seconds
  Start Mode                : Start-Closed
  Fail Mode                 : Fail-Closed
  MKA CAK Length            : 16
  MACsec Policy             : Aggregator-Connect
```

If the policy with given name does not exist:

```
switch# show aaa authentication port-access dot1x supplicant policy New_CX_Policy
The policy does not exist.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10.1000	Added EAPoL source MAC address and MKA CAK length on 6300 Switches.
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authentication port-access dot1x supplicant statistics

```
show aaa authentication port-access dot1x supplicant statistics
[interface {<IFRANGE> | vlan <VLAN-ID>}]
```

Description

Shows the 802.1X supplicant statistics on each 802.1X supplicant-enabled interface.

Parameter	Description
<IFRANGE>	Specifies the range of VLAN interfaces for which the supplicant status is shown.
vlan *<VLAN-ID>*	Specifies a VLAN interface for which the supplicant status is shown.

Examples

Showing the 802.1X supplicant statistics on all enabled interfaces:

```
switch# show aaa authentication port-access dot1x supplicant statistics

802.1X Supplicant Statistics

Interface 1/1/1
===================

  EAPOL Frames Received                  : 4
  EAPOL Frames Transmitted               : 3
  EAPOL Start Frames Transmitted         : 1
  EAPOL Logoff Frames Transmitted        : 0
  EAPOL Invalid Frames Received          : 0
  EAPOL EAP Length Error Frames Received : 0
  Authentication                         : 0
  Authentication Timeout                 : 0
  EAP-Logoff While Authenticating        : 0
  Successful Authentication              : 0
  Failed Authentication                  : 0
  Re-Authentication                      : 0
  EAP-Logoff When Authenticated          : 0

Interface 1/1/2
===================

  EAPOL Frames Received                  : 0
  EAPOL Frames Transmitted               : 1
  EAPOL Start Frames Transmitted         : 1
  EAPOL Logoff Frames Transmitted        : 0
  EAPOL Invalid Frames Received          : 0
  EAPOL EAP Length Error Frames Received : 0
  Authentication                         : 0
  Authentication Timeout                 : 0
  EAP-Logoff While Authenticating        : 0
  Successful Authentication              : 0
  Failed Authentication                  : 0
  Re-Authentication                      : 0
  EAP-Logoff When Authenticated          : 0
```

Showing the 802.1X supplicant status on a specific interface:

```
switch# show aaa authentication port-access dot1x supplicant statistics interface
1/1/1

802.1X Supplicant Statistics

Interface 1/1/1
===================
  EAPOL Frames Received                    : 4
  EAPOL Frames Transmitted                 : 3
  EAPO Start Frames Transmitted            : 1
  EAPOL Logoff Frames Transmitted          : 0
  EAPOL Invalid Frames Received            : 0
  EAPOL EAP Length Error Frames Received : 0
  Authentication                           : 0
  Authentication Timeout                   : 0
  EAP-Logoff While Authenticating          : 0
  Successful Authentication                : 0
  Failed Authentication                    : 0
  Re-Authentication                        : 0
  EAP-Logoff When Authenticated            : 0
```

Showing the message when the feature is not enabled on any interface of the system:

```
switch# show aaa authentication port-access dot1x supplicant statistics
802.1X supplicant is not configured.
```

Showing the message when the feature is not enabled on the interface:

```
switch# show aaa authentication port-access dot1x supplicant statistics interface
1/1/1
802.1X supplicant is not configured.
```

Showing the message when there are no 802.1X supplicants on the system:

```
switch# show aaa authentication port-access dot1x supplicant status
No 802.1X supplicants found.
```

Showing the message when there are no 802.1X supplicants on the interface:

```
switch# show aaa authentication port-access dot1x supplicant status interface
1/1/1
No 802.1X supplicants found.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authentication port-access dot1x supplicant status

```
show aaa authentication port-access dot1x supplicant status
[interface {<IFRANGE> | vlan <VLAN-ID>}]
```

Description

Shows the 802.1X supplicant status on each 802.1X supplicant-enabled interface.

Parameter	Description
`<IFRANGE>`	Specifies the range of VLAN interfaces for which the supplicant status is shown.
`vlan <VLAN-ID>`	Specifies a VLAN interface for which the supplicant status is shown.

Usage

- Physical Address Extension (PAE) state:
  - **Initialize**—Authentication is yet to start for the PAE.
  - **Authenticating**—Authentication is in-progress for the PAE.
  - **Authenticated**—Authentication is successful for the PAE.
  - **Held**—Authentication has failed for the PAE and no further authentication attempts will be made till the held period expires.
  - **Unauthenticated**—Authentication has failed for the PAE and no further authentication attempts will be made.
  - **Logoff**—The PAE no longer wishes to be authenticated.
- Status and forwarding state (FS):
  - **Open**—The PAE did not find a 802.1X authenticator within the discovery period. FS: Forwarding
  - **Blocked**—The PAE is currently authenticating and the port is operating in start-mode start-closed or has failed authentication and the port is operating in fail-mode fail-closed. FS: Blocked
  - **Disabled**—The port to which the interface is attached is not ready or has an invalid configuration. FS: Blocked
  - **Secured**—The PAE is authenticated. FS: Forwarding
  - **Start-Open**—The PAE is currently authenticating and the port is operating in start-mode start-open. FS: Forwarding
  - **Fail-Open**—The PAE has failed authentication and the port is operating in fail-mode fail-open. FS: Forwarding

Examples

Showing the 802.1X supplicant status on all enabled interfaces:

```
switch# show aaa authentication port-access dot1x supplicant status

802.1X Supplicant Status

 Interface  Policy         PAE State        Authenticator      EAP Method  Status
 -------- --------------- ---------------- ------------------ ----------- --------
--
 1/1/1     CX_Policy_01    Authenticated    38:21:c7:59:ad:27  EAP-TLS     Secured
 1/1/2     CX_Policy_02    Authenticating   38:21:c7:59:ad:28  EAP-MD5     Blocked
 1/1/3     CX_Policy_01    Unauthenticated  38:21:c7:59:ad:29  EAP-TLS     Fail-
Open
 1/1/4     CX_Policy_03    Unauthenticated  --                 --          Open
```

Showing the 802.1X supplicant status on a specific interface:

```
switch# show aaa authentication port-access dot1x supplicant status interface
1/1/1

802.1X Supplicant Status

 Interface  Policy          PAE State        Authenticator      EAP Method  Status
 ---------- --------------- --------------- ------------------ ----------- -------
---
 1/1/1      CX_Policy_01    Authenticated    38:21:c7:59:ad:27  EAP-TLS
Secured
```

Showing the message when the feature is not enabled on any interface of the system:

```
switch# show aaa authentication port-access dot1x supplicant status
802.1X supplicant is not configured.
```

Showing the message when the feature is not enabled on the interface:

```
switch# show aaa authentication port-access dot1x supplicant status interface
1/1/1
802.1X supplicant is not configured.
```

When an interface range is entered, this message is displayed only if the 802.1X supplicant is disabled either globally or on each interface specified in the user input.

Showing the message when there are no 802.1X supplicants on the system:

```
switch# show aaa authentication port-access dot1x supplicant status
No 802.1X supplicants found.
```

Showing the message when there are no 802.1X supplicants on the interface:

```
switch# show aaa authentication port-access dot1x supplicant status interface
1/1/1
No 802.1X supplicants found.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

start-mode

```
start-mode[start-closed | start-open]
no start-mode [start-closed | start-open]
```

Description

Configures the forwarding behavior of the interface on the data-plane when the authentication is in-progress during the first run of the supplicant. Default: start-open.

The **no** form of the command resets it to the default.

Examples

Configuring the start mode as start-closed:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# start-mode start-closed
```

Resetting the start mode to the default value in the system:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# no start-mode

OR

switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)#policy CX_Policy
switch(config-dot1x-supp-policy)# no start-mode start-closed
```

When the value does not match the currently configured non-default value for start-mode:

```
switch(config)# aaa authentication port-access dot1x supplicant
switch(config-dot1x-supp)# policy CX_Policy
switch(config-dot1x-supp-policy)# start-mode start-closed
switch(config-dot1x-supp-policy)# no start-mode start-open
The input value does not match the currently configured value.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-dot1x-supp`
	`config-dot1x-supp-policy`
		Administrators or local user group members with execution rights for this command.

Chapter 116

Port access cached-critical role commands

aaa authentication port-access cached-critical-role (global)

```
aaa authentication port-access cached-critical-role
   enable
   disable
   cache-timeout <HOURS>
   cache-replace-mode {fifo|none}
   no ...
   persistent-storage {enable |write-interval <INTERVAL>}
```

Description

Enters the cached-critical role context (shown in the switch prompt as config-aaa-ccr). The cached-critical role allows the authorization of authenticated clients with the previously applied roles when the RADIUS server is unreachable.

By default, the cached-critical role is disabled at the global level. When the cached-critical user role is enabled, the MAC address of clients and their applied roles are cached in the following cases:

- During the client log-off.
- When a client fails to reach the server during reauthentication.
- All the RADIUS servers in the server group are not reachable. In this case, the details of the clients authenticated with the server group are cached.

When the RADIUS server is unreachable, the cached-critical role is applied as a special role. The cached-critical role can be applied only on authentication-enabled ports.

> If a server group configured on a port becomes unreachable, caching is not performed for individual clients dependent that group.

By enabling the **persistent-storage** configuration, the cached-critical role support for the clients will be available across switch reboots. With this configuration enabled, the client information is cached in the persistent memory of the switch. The information stored in the persistent storage is updated periodically and the interval between the updates is configurable using the **write-interval** CLI option, with a default interval of 3600 seconds. The update to the persistent storage is only done if there is a difference in the client information since the last write.

The **no** form of the command disables the cached-critical role. This is the default.

- The **persistent-storage** option must be enabled *before* the clients are onboarded. If the configuration is disabled after a client has onboarded, the feature might not work across a reboot for the clients which are onboarded with DUR/RADIUS roles.
- If the cached-critical user role needs to be modified to add a captive portal profile, use the **port-access clear cached-client role <ROLE>** command to clear the cached clients on the role before it is modified.
- Enabling **persistent-storage** on the switch might reduce the lifespan of persistent memory.

Parameter	Description
`enable`	Enables the cached-critical role on the authentication-enabled ports.
`disable`	Disables the cached-critical role. (Default)
`cache-timeout <HOURS>`	Specifies the timeout period for the client details to be cached in the switch. A timer runs for every 30 minutes interval to check whether the client is valid to stay cached. On a timeout, the cached entry is removed from the switch within the buffer time of 30 minutes. Default: 96 hours. Range: 1 to 168 hours.
`cache-replace-mode {fifo|none}`	Sets the cache replacement mode. ■ **fifo**: Sets the cache replace mode to **fifo** (First in, first out). If the number of cached clients in the system exceeds the limit of 1024, the oldest cache entry of the client is replaced with a new entry. ■ **none**: Sets the cache replace mode to **none**. If the number of cached clients in the system exceeds the limit of 1024, the new client details will not be cached. This is the default.
`no ...`	Negates any existing parameter.
`persistent-storage {enable |write-interval <900-86400>}`	Configures the persistent storage for cached clients. ■ **enable**: Enables persistent storage for the cached clients. ■ **write-interval**: Configures the interval between consecutive writes to persistent storage in seconds. Range: 900 to 86400 seconds. Default: 3600 seconds.

Examples

Enabling the cached-critical-role at the global level with a cache timeout period of **72** hours and cache replace mode as **fifo**:

```
switch(config)# aaa authentication port-access cached-critical-role
switch(config-aaa-ccr)# enable
switch(config-aaa-ccr)# cache-timeout 72
switch(config-aaa-ccr)# cache-replace-mode fifo
```

Disabling the cached-critical role at the global level:

```
switch(config)# aaa authentication port-access cached-critical-role
switch(config-aaa-ccr)# disable
```

Enabling and configuring persistent storage:

```
switch(config)#aaa authentication port-access cached-critical-role
switch(config-aaa-ccr)# persistent-storage
switch(config-aaa-ccr-ps)# enable
switch(config-aaa-ccr-ps)# write-interval 7200
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11.1000	The **persistent-storage** parameter is added.
10.10	Command introduced on the 4100i, 6200, 6300, 6400, 8100, 8360.

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-aaa-ccr`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access cached-critical-role (per interface)

```
aaa authentication port-access cached-critical-role
no aaa authentication port-access cached-critical-role
```

Description

Enables or disables cached-critical role feature on a specific interface. The cached-critical role allows the authenticated client to be authorized with the previously applied roles when the RADIUS server is unreachable.

By default, the cached-critical role feature is enabled at the port level if the cached-critical role is already enabled globally. This command can be used to configure the cached-user role on the specific ports where the caching is needed.

The **no** form of the command disables the cached-critical role on a specific interface.

Examples

Enabling the cached-critical role on the specific port:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access cached-critical-role
```

Disabling the cached-critical role on the specific port:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access cached-critical-role
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 4100i, 6200, 6300, 6400, 8100, 8360.

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

port-access clear cached-client

`port-access clear cached-client [all | mac <MACADDR> | role <ROLENAME>]`

Description

Clears all the cached clients or clears cached clients based on the MAC address or role name.

Parameter	Description
`all`	Clears all the cached clients.
`mac <MACADDR>`	Clears cached clients based on the MAC address.
`role <ROLENAME>`	Clears cached clients based on the role.

Examples

Clearing all the cached clients:

```
switch# port-access clear cached-client all
```

Clearing the cached clients based on the MAC address:

```
switch# port-access clear cached-client mac 00:0a:0b:0c:0d:0e
```

Clearing the cached clients based on the role:

```
switch# port-access clear cached-client ap_role
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced on the 4100i, 6200, 6300, 6400, 8100, 8360.

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show port-access cached-clients

```
show port-access cached-clients [mac <MAC-ADDRESS>][role <ROLE-NAME>]
```

Description

Shows summarized information of all cached port-access clients on the system. The output can be filtered by MAC address or role.

The role name is not displayed for clients that use a RADIUS role without a base role.

Parameter	Description
<MAC-ADDRESS>	Specifies the MAC address of the client.
<ROLE-NAME>	Specifies the role of the client.

Examples

Showing summarized information for all cached port-access clients on the system:

```
switch# show port-access cached-clients
Port Access Cached-Clients
RADIUS overridden user roles are suffixed with '*'
----------------------------------------------------------------------------
MAC-Address        Role              Cached-Duration
----------------------------------------------------------------------------
00:50:56:bd:04:c8  ap-role           3 Days, 22 Hours, 33 Minutes, 44 Seconds
00:50:56:bd:32:07                    1 Day, 1 Hour, 1 Minute, 1 Second
00:50:56:bd:32:08                    12 Hours, 34 Minutes, 56 Seconds
00:50:56:cd:32:09  ap-role           12 Hours, 56 Seconds
00:50:56:bd:50:43  employee          12 Hours
00:50:56:bd:50:45  printer           34 Minutes
08:97:34:ad:e4:00  role_01_Student   56 Seconds
10:2f:09:89:00:35  A-Role*           54 Minutes, 26 Seconds
```

Showing information for a specific client based on the MAC address:

```
switch# show port-access cached-clients clients mac 00:50:57:bd:32:09
Port Access Cached-Clients
RADIUS overridden user roles are suffixed with '*'
---------------------------------------------------------------------------
MAC-Address        Role               Cached-Duration
---------------------------------------------------------------------------
00:50:56:bd:32:08                     12 Hours, 34 Minutes, 56 Seconds
```

Showing information for a specific client based on the role:

```
switch# show port-access cached-clients role
ROLE  The role name.
switch# show port-access cached-clients role intern
No port-access cached-clients found
switch# show port-access cached-clients role ap-role
Port Access Cached-Clients
RADIUS overridden user roles are suffixed with '*'
---------------------------------------------------------------------------
MAC-Address        Role               Cached-Duration
---------------------------------------------------------------------------
00:50:56:bd:04:c8  ap-role            3 Days, 22 Hours, 33 Minutes, 44 Seconds
00:50:56:cd:32:09  ap-role            12 Hours, 56 Seconds
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command output modified to be suffixed with * for RADIUS overridden user roles. The role name will not displayed for clients that use a RADIUS role without a base role.
10.10	Command introduced on the 4100i, 6200, 6300, 6400, 8100, 8360.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access cached-critical-role info

```
show port-access cached-critical-role info
```

Description

Shows summarized information of port-access cached-critical role configuration.

Examples

Showing summarized information of the cached-critical role configuration with the status of cached-critical role **Disabled**:

```
switch# show port-access cached-critical-role info

Port Access Cached-Critical-Role
=================================

  Cached-Critical-Role Status          : Disabled
  Cache-Timeout                        : 96 Hours
  Cache Replace Mode                   : None
  Cached-Critical-Role Disabled Ports :
  Persistent Storage Status            : Disabled
  Persistent Storage Write Interval    : 900 Seconds
  Last Write To Persistent Storage     : N/A
```

Showing summarized information of the cached-critical role configuration with the status of cached-critical role **Enabled**:

```
switch# show port-access cached-critical-role info

Port Access Cached-Critical-Role
=================================

  Cached-Critical-Role Status          : Enabled
  Cache-Timeout                        : 100 Hours
  Cache Replace Mode                   : FIFO
  Cached-Critical-Role Disabled Ports : 1/1/1-1/1/5,1/1/10
  Persistent Storage Status            : Enabled
  Persistent Storage Write Interval    : 7200 Seconds
  Last Write To Persistent Storage     : Mon Aug 08 04:40:49 UTC 2022
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.11.1000	The output is updated to display persistent storage related information.
10.10	Command introduced on the 4100i, 6200, 6300, 6400, 8100, 8360.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 117

Port access general commands

aaa authentication port-access allow-lldp-auth

```
aaa authentication port-access allow-lldp-auth [mac chassis-mac|source-mac]
no aaa authentication port-access allow-lldp-auth [mac chassis-mac|source-mac]
```

Description

This command is an extension of **aaa authentication port-access allow-lldp-auth**.

By default, authentication on chassis-mac is allowed via LLDP packets which are received on the port. Use the Chassis MAC shown in the LLDP TLV or the source MAC in the LLDP frame.

Use the **no** version of this command to prevent authentication using LLDP packets received on the port. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts along with the following commands:

```
interface lag 1
        aaa authentication port access
allow-lldp-bpdu
        aaa authentiction port access
allow-lldp-auth mac source-mac
```

Parameter	Description
`mac`	(Optional) Specify the LLDP authentication-mac type.
`chassis-mac`	Configure LLDP authentication-mac type as a chassis MAC address. This is the default value.
`source-mac`	Configure LLDP authentication-mac type as an interface MAC address

Examples

Configuring authentication via LLDP packets:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-lldp-auth
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access allow-lldp-auth
```

Enabling/disabling authentication via LLDP BPDU packets:

```
switch(config-if)# aaa authentication port-access
allow-lldp-auth Allow or block authentication on LLDP BPDU. (Default:
allow)
```

```
switch(config-if)# no aaa authentication port-access
allow-lldp-auth Allow or block authentication on LLDP BPDU. (Default:
allow)
switch(config-if)# aaa authentication port-access allow-lldp-auth
switch(config-if)# no aaa authentication port-access allow-lldp-auth

switch(config-if)# aaa authentication port-access
block-lldp-auth Allow or block authentication on LLDP BPDU. (Default:
block)
switch(config-if)# no aaa authentication port-access
block-lldp-auth Allow or block authentication on LLDP BPDU. (Default:
block)
```

Configuring the MAC to use for authentication:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-lldp-auth mac source-mac
switch(config-if)# aaa authentication port-access allow-lldp-auth mac chassis-mac
```

```
switch(config-if)# aaa authentication port-access allow-lldp-auth
mac    Configure the MAC to use for LLDP based authentication (Default:
chassismac)

switch(config-if)# aaa authentication port-access allow-lldp-auth mac
chassis-mac   Use the chassis MAC in LLDP TLV.
source-mac       Use the source MAC in the LLDP frame.
```

Disabling authentication via LLDP packets based on MAC source:

```
switch(config-if)# no aaa authentication port-access allow-lldp-auth mac
chassis-mac     Use the chassis MAC in LLDP TLV.
source-mac      Use the source MAC in the LLDP frame.
```

Disabling authentication via LLDP packets on a LAG port:

```
switch (config) interface lag 1
switch(config-lag if)# no aaa authentication port-access allow-lldp-auth
```

When a client such as dual-homed access points and switches, connects to the switch over multiple physical interfaces and use LLDP packets to onboard, it is recommended to use LLDP authentication MAC as the source MAC on the interfaces. This prevents the switch from learning the client MAC from the chassis MAC in the LLDP TLV (default), similarly to the LLDP BPDUs received on all interfaces connected to the same device. If the MAC learned is the chassis MAC, it will cause the switch to treat the client as moving between the different interfaces each time a LLDP BPDU is received on an interface. Additionally, using a different LLDP authentication MAC type on interfaces connecting to the same device may lead to undesired behavior.

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access allow-cdp-auth

```
aaa authentication port-access allow-cdp-auth
no aaa authentication port-access allow-cdp-auth
```

Description

By default authentication is allowed via CDP packets which are received on the port. Use the **no** version of this command to prevent authentication using CDP packets received on the port. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

Examples

Disabling authentication via CDP packets:

```
switch(config-if)# no aaa authentication port-access allow-cdp-auth
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued on a LAG port
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access auth-mode

```
aaa authentication port-access auth-mode {client-mode | device-mode | multi-domain}
```

Description

Configures the authentication mode for the port. By default, client mode is enabled. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

Parameter	Description
`client-mode`	Selects client mode. In this mode, all clients connecting to the port are sent for authentication. The maximum number of clients allowed to connect to the port is limited by the client limit value configured with the **aaa authentication port-access client-limit** command.
`device-mode`	Selects device mode. In this mode, only the first client connecting to the port is sent for authentication. Once this client is authenticated, the port is considered as open and all subsequent clients trying to connect on that port are not sent for authentication.
`multi-domain`	Selects multidomain mode. In this mode only one voice device is allowed to be authenticated in addition to the configured data devices on a port. By default only one data device is allowed to be authenticated on the multidomain mode along with one voice device. You can configure the maximum number of data devices allowed with the **aaa authentication port-access client-limit multi-domain** command. If a second voice device or a data device greater than the configured data client limit onboards, a violation is triggered. You must configure a voice VLAN for IP phones to onboard a voice device in the multidomain authentication mode. To authorize a voice device, you must perform one of the following: ▪ Configure the AAA server to send the **Aruba-Device-Traffic-Class** Aruba VSA with value **1**. ▪ Configure the **device-traffic-class** parameter in the role to be applied to indicate a voice device. Without this VSA value or the device type in the role, the switch considers the voice device as a data device. **NOTE:** This parameter is not supported when the command is issued from the LAG (**config-lag-if**) context.

Examples

Configuring device mode authentication for interface 1/1/1:

```
switch(config)# interface  1/1/1
switch(config-if)# aaa authentication port-access auth-mode device-mode
```

Configuring device mode authentication for a LAG port:

```
switch(config)# interface lag 1
switch(config-lag if)# aaa authentication port-access auth-mode device-mode
```

Configuring multidomain mode authentication for a port:

```
switch(config)# interface  1/1/1
switch(config-if)# aaa authentication port-access auth-mode multi-domain
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.08	Added **multi-domain** parameter
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access auth-precedence

```
aaa authentication port-access auth-precedence [dot1x mac-auth | mac-auth dot1x]
no aaa authentication port-access auth-precedence [dot1x mac-auth | mac-auth dot1x]
no aaa authentication port-access auth-precedence
```

Description

Configures the per port authentication precedence using the space separator.

By default, 802.1X authentication (**dot1x**) takes a higher precedence than MAC authentication (**mac-auth**).

The **no** form of the command resets the port access authentication precedence to the default, 802.1X authentication followed by MAC authentication.

Parameter	Description
`dot1x mac-auth`	Specifies that the port access authentication precedence is 802.1X authentication followed by MAC authentication.
`mac-auth dot1x`	Specifies that the port access authentication precedence is MAC authentication followed by 802.1X authentication.

Examples

Configuring MAC authentication precedence on a port:

```
switch(config-if)# aaa authentication port-access auth-precedence mac-auth dot1x
```

Resetting the authentication precedence to the default value:

```
switch(config-if)# no aaa authentication port-access auth-precedence mac-auth
dot1x
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access auth-priority

```
aaa authentication port-access auth-priority [dot1x mac-auth | mac-auth dot1x]
no aaa authentication port-access auth-priority [dot1x mac-auth | mac-auth  dot1x]
no aaa authentication port-access auth-priority
```

Description

Configures the authentication priority using the space separator to specific interface.

Default **auth-priority** with concurrent onboarding is 802.1X followed by MAC authentication. With authentication precedence, the default **auth-priority** follows the **auth-precedence** order.

The **no** form of the command resets the port access authentication priority to the default, is same as the configured **auth-precedence** order.

The authentication priority is useful in deployments where clients such as wireless access points (APs), IT-compliant-laptops or phones, or laptops without pre-loaded supplicant software must download the supplicant software or firmware patches before attempting 802.1X authentication. In such cases, configure the MAC authentication as the primary authentication method followed by 802.1X for the authentication order. Meanwhile, configure 802.1X as the primary authentication priority and MAC authentication as secondary to enforce access based on 802.1X. Thus the client (or end access device) will initially be authenticated by MAC authentication with the access required to onboard and install the software or patches, and subsequently attempt the 802.1X authentication.

Reauthentication will be triggered for all high priority methods and not just the final successful authentication method.

Parameter	Description
`dot1x mac-auth`	Specifies that the port access authentication precedence is 802.1X authentication followed by MAC authentication.

Parameter	Description
`mac-auth dot1x`	Specifies that the port access authentication precedence is MAC authentication followed by 802.1X authentication.

Examples

Configuring MAC authentication priority on a port:

```
switch(config-if)# aaa authentication port-access auth-priority mac-auth dot1x
```

Resetting the authentication priority to the default value:

```
switch(config-if)# no aaa authentication port-access auth-priority mac-auth dot1x
switch(config-if)# no aaa authentication port-access auth-priority
```

Sample configuration:

```
interface 1/1/1
    no shutdown
    no routing
    vlan access 1
    aaa authentication port-access auth-precedence mac-auth dot1x
    aaa authentication port-access auth-priority dot1x mac-auth
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access auth-role

```
aaa authentication port-access [critical-role|preauth-role|reject-role|
   auth-role|critical-voice-role] <ROLE-NAME>
no aaa authentication port-access [critical-role|preauth-role|reject-role|
   auth-role|critical-voice-role]
```

Description

Configures the role to assign to the clients depending on the client authentication state.

The **no** form of the command disassociates the roles that you assign to clients based on the authentication state.

Parameter	Description
`critical-role`	Specifies the role that is applied when the RADIUS server is unreachable for authentication or when there is a request timeout.
`preauth-role`	Specifies the role that is applied when authentication is still in progress.
`reject-role`	Specifies the role that is applied when authentication has failed.
`auth-role`	Specifies the role that is applied to authenticated clients when a specific role is not assigned in the RADIUS server.
`critical-voice-role`	Specifies the role for a voice client when the RADIUS server is unreachable for authentication during reauthentication period. This is applicable when multidomain authentication mode is enabled with the **aaa authentication port-access auth-mode** command.
`<ROLE-NAME>`	Specifies the role name.

Examples

Configuring critical role for clients:

```
switch(config-if)# aaa authentication port-access critical-role role1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Added **critical-voice-role** parameter
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access client-auto-log-off final-authentication-failure

```
aaa authentication port-access client-auto-log-off final-authentication-failure
no aaa authentication port-access client-auto-log-off final-authentication-failure
```

Description

Use this command to automatically remove a client when authentication fails due to any reason except **server-reject** or **server-timeout**. This feature is disabled by default.

The **no** form of this command disables this feature if it has been previously enabled.

Automatic client log-off is not supported on Layer-3 interfaces.

Examples

Configuring the client-auto-log-off feature on interface 1/1/1:

```
switch(config)# interface  1/1/1
switch(config-if)# aaa authentication port-access client-auto-log-off final-
authentication-failure
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08.1090	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access client-limit

```
aaa authentication port-access client-limit <CLIENTS>
no aaa authentication port-access client-limit
```

Description

Configures the maximum number of clients that can simultaneously connect to a port. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

The **no** form of this command resets the number of clients to the default.

Parameter	Description
<CLIENTS>	Specifies the maximum number of clients. Default: 1. Range: 1 to 256 (6300, 6400).

Examples

Configuring the client limit for on port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access client-limit 25
```

Configuring the client limit for on a LAG port:

```
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access client-limit 25
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access client-limit multi-domain

`aaa authentication port-access client-limit multi-domain <DATA-CLIENT-LIMIT>`

Description

Configures the data client limit on the multidomain enabled interface. By default, the data client limit on a multidomain enabled interface is **1**, and the maximum number of data clients supported on a multidomain enabled port is **5**.

Parameter	Description
<DATA-CLIENT-LIMIT>	Specifies the maximum data client limit on the multidomain enabled interface. Range: **1** to **5**.

Examples

Configuring data client limit of **4** on the multidomain enabled interface **1/1/4**:

```
switch(config)# interface  1/1/1
switch(config-if)# aaa authentication port-access client-limit multi-domain 4
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access radius-override

```
aaa authentication port-access radius-override {enable | disable}
no aaa authentication port-access radius-override {enable | disable}
```

Description

Enables or disables **radius-override** support at the interface context. When **radius-override** support is enabled, a new RADIUS overridden role is created with a combination of LUR/DUR along with RADIUS attributes for the corresponding client-role attributes such as VLANs, captive portal URL, and downloadable gateway role. When the RADIUS override support is disabled, then only the user-roles get applied to the client.

The **no** form of this command disables the support for **radius-override**.

The **radius-override** support is applicable only for Auth-role.

Usage

The following table describes the access-response for the combination of roles with **radius-override** enabled and disabled:

Combination of roles in Access-Accept	Action with *radius-override* disabled	Action with *radius-override* enabled
Local User Role and RADIUS attributes	Local User Role is applied	New RADIUS Overridden role with Local User Role and RADIUS attributes is created and applied
Downloadable User Role and RADIUS attributes	Downloadable User Role is applied	New RADIUS Overridden role with Downloadable User Role and RADIUS attribute is created and applied
Local User Role and Downloadable User Role	Local User Role is applied	Local User Role is applied

Combination of roles in Access-Accept	Action with *radius-override* disabled	Action with *radius-override* enabled
Local User Role, Downloadable User Role, and RADIUS attributes	Local User Role is applied	New RADIUS Overridden role with Local User Role and RADIUS attributes is created and applied

Examples

Enabling radius-override support:

```
switch(config-if)# aaa authentication port-access radius-override enable
```

```
switch(config-if)# no aaa authentication port-access radius-override disable
```

Disabling radius-override support:

```
switch(config-if)# aaa authentication port-access radius-override disable
```

```
switch(config-if)# no aaa authentication port-access radius-override enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

port-access allow-flood-traffic

```
port-access allow-flood-traffic {enable | disable}
```

Description

Enables or disables transmission of flood traffic, such as broadcast, multicast, and unknown unicast messages through a security enabled port on which no client has been authenticated. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts. By default, transmission of flood traffic is disabled.

Usage

This command can be used to allow Wake-on-LAN packets on security enabled ports, before a client is authenticated.

Examples

Enabling flood traffic on a port on interface 1/1/1:

```
switch(config)# interface  1/1/1
switch(config-if)# port-access allow-flood-traffic
```

Enabling flood traffic on a port on a LAG port:

```
switch(config)# interface lag 1
switch(config-lag-if)# port-access allow-flood-traffic
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

port-access auto-vlan

```
port-access auto-vlan
no port-access auto-vlan
```

Description

Creates VLAN automatically for the port-access clients globally, if the VLAN is not configured statically on the switch. By default, **port-access auto-vlan** is disabled.

The **no** form of this command disables the port-access automatic VLAN creation globally on the switch.

The type for the VLAN created using the auto-vlan feature is displayed as **port-access** in the **show vlan** command.

Examples

Enabling automatic VLAN creation for clients:

```
switch(config)# port-access auto-vlan
```

Disabling automatic VLAN creation for clients(default):

```
switch(config)# no port-access auto-vlan
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

port-access client-move

```
port-access client-move {enable | disable | secure}
```

Description

When client move is enabled (the default), a port access client can move to other port access-enabled interfaces, at which time they will be re-authenticated on the new interface.

When client move is disabled, a client cannot move to other port access-enabled interfaces.

An authenticated client will be moved immediately if the new port to which the client will move has a pre-auth role configured, even when client move is enabled as secure.

Parameter	Description
enable	Enables this feature so port access clients can move to other port access-enabled interfaces.
disable	Disables this feature so port access clients cannot move to other port access-enabled interfaces.
secure	Use this configuration setting to stop a potential attacker from denying a genuine client access by spoofing the client's MAC on a different port-access enabled port of the switch. An authenticated client will be moved immediately if the new port to which the client moved has a pre-authentication role configured, even when client-move is enabled as secure.

Parameter	Description
	NOTE: Secure client move is enabled by default.

Examples

Enabling client move:

```
switch(config)# port-access client-move enable
```

Enabling secure client move:

```
switch(config)# port-access client-move enable secure
```

Disabling client move:

```
switch(config)# port-access client-move disable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

port-access event-log client

```
port-access event-log client
no port-access event-log client
```

Description

Enables port access informational event logs for the client. These event logs help with client telemetry on a remote management station such as Aruba Central. By default, these informational event logs are disabled.

Starting with AOS-CX 10.10, the event IDs 10510 and 10511 are logged when the port access informational event log configuration is enabled.

The **no** form of the command disables port access informational event logs for the client.

Example

Enabling port access event log:

```
switch(config)# port-access event-log client
```

Disabling port access event log:

```
switch(config)# no port-access event-log client
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

port-access fallback-role

```
port-access fallback-role <ROLE-NAME>
no port-access fallback-role <ROLE-NAME>
```

Description

Configures the fallback role to assign to the clients onboarding on a port. This role is applied only when no derived role is applied to the clients.

The **no** form of the command resets the fallback role.

Parameter	Description
<ROLE-NAME>	Specifies the fallback role name. The maximum number of characters supported is 64.

Usage

Following are the conditions for the fallback role to be applied on onboarding devices:

- The device profile local MAC match feature with block-until-profile-applied mode is configured.
- Device profile along with AAA is configured but no match was found for the device profile client.
- AAA method with no reject or critical role is configured, and the connection to RADIUS server failed.

- 802.1X authentication is enabled on the port, but the supplicant of the device timed out to respond to the authentication request.

Example

On the 6400 Switch Series, interface identification differs.

Configuring fallback role for a port:

```
switch(config)# interface  1/1/3
switch(config-if)# port-access fallback-role fallback01
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

port-access log-off client

```
port-access log-off client mac <MAC-ADDRESS>
port-access log-off client interface <INTERFACE-NAME>
port-access log-off client role <ROLE-NAME>
```

Description

Logs off the client connected to a port access-enabled interface.

Parameter	Description
<MAC-ADDRESS>	Specifies the client MAC address.
<INTERFACE-NAME>	Specifies the client interface.
<ROLE-NAME>	Specifies the client MAC address.

Example

Logging a client off from the switch, specifying the MAC address:

```
switch# port-access log-off client mac 00:50:56:bd:04:2d
```

Logging a client off from the switch, specifying the interface:

```
switch# port-access log-off client interface 1/1/1
```

Logging a client off from the switch, specifying the role:

```
switch# port-access log-off client role r1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

port-access onboarding-method precedence

```
port-access onboarding-method precedence [aaa device-profile | device-profile aaa]
no port-access onboarding-method precedence [aaa device-profile | device-profile aaa]
```

Description

Configures the precedence for the method to be used to authenticate onboarding devices for each interface.

The **no** form of the command resets the authentication method precedence to the default precedence of AAA followed by device profile.

AAA includes the 802.1X and MAC authentication methods whose precedence can be configured using the **aaa authentication port-access auth-precedence** command. Here, the default precedence is 802.1X authentication.

For example, if you configure AAA (both 802.1X and MAC) authentication methods and device profile on a port, by default, the authentication precedence would be 802.1X, then MAC, and lastly device profile.

aaa in the parameters refers to the authentication precedence configured using the **aaa authentication port-access auth-precedence** command.

Parameter	Description
`aaa device-profile`	Specifies that the precedence for per port onboarding authentication method is AAA followed by device profile.
`device-profile aaa`	Specifies that the precedence for per port onboarding authentication method is device profile followed by AAA.

Examples

On the 6400 Switch Series, interface identification differs.

Configuring AAA method precedence on a port:

```
switch(config)# interface  1/1/1
switch(config-if)# port-access onboarding-method precedence device-profile aaa
```

Resetting the authentication method precedence:

```
switch(config)# interface  1/1/1
switch(config-if)# no port-access onboarding-method precedence device-profile aaa
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

port-access onboarding-method concurrent

```
port-access onboarding-method concurrent <enable | disable>
```

Description

Configures all methods to start concurrently for faster onboarding process. If authentication priority is not configured when enabling concurrent onboarding, the priority will be 802.1X followed by **mac-auth** and **device-profile**.

Default priority for concurrent onboarding is 802.1X followed by **mac-auth** and **device-profile**.

When enabling concurrent onboarding on the port, existing clients will be de-authenticated and freshly onboarded concurrently.

When concurrent onboarding is enabled, then auth-precedence will be ignored.

If concurrent onboarding is configured, the client will stay in pre-auth role till it gets succeeded by one authentication method or gets failed by all the authentication methods.

When the authentication method with the highest priority fails, the profile of the next successful authentication method is applied.

If all methods fail, the reject or critical role is applied based on the 802.1X authentication failure reason and continues to reauthenticate with the 802.1X method.

Reauthentication will be triggered for all high priority methods and not just the final successful authentication method.

Some RADIUS server may block the client when it receives two requests, **mac-auth** and 802.1X, from the same client at the same time. This is because the RADIUS server allows only one authentication request. In such cases, concurrent onboarding is not feasible. To prevent such scenarios, configure **auth-precedence** with **auth-priority**.

Parameter	Description
`enable`	Enable clients to be onboarded concurrently.
`disable`	Disable clients to be onboarded concurrently.

Examples

On the 6400 Switch Series, interface identification differs.

Enabling concurrent onboarding on a port:

```
switch(config)# interface  1/1/1
switch(config-if)# port-access onboarding-method concurrent enable
```

Disabling concurrent onboarding on a port:

```
switch(config)# interface  1/1/1
switch(config-if)# port-access onboarding-method concurrent disable
```

Sample configuration:

```
interface 1/1/1
    no shutdown
    no routing
    vlan access 999
    !aaa authentication port-access auth-precedence mac-auth dot1x
    port-access onboarding-method concurrent enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

port-access reauthenticate interface

```
port-access reauthenticate interface <INTERFACE-NAME>
```

Description

Forcefully reauthenticates all clients connected to an interface.

Clients that are in the **HELD** state are ignored.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface name.

Examples

Configuring reauthentication of all clients on a port:

```
switch# port-access reauthenticate interface 1/1/1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

port-access ubt-fallback-role

```
port-access ubt-fallback-role <ROLE-NAME>
no port-access ubt-fallback-role <ROLE-NAME>
```

Description

Configures the UBT fallback role to assign to the clients on a port. This role is applied to a client only when the corresponding UBT zone is not reachable. The role on the client is reverted to the previous role to which it was assigned to when the UBT zone is reachable.

The **no** form of the command deletes the UBT fallback role on a port.

Parameter	Description
<ROLE-NAME>	Specifies the UBT fallback role name. The maximum number of characters supported is 64.

Usage

The UBT fallback role is applied to a client only when the corresponding UBT zone is not reachable. When the UBT zone is reachable, the role on the client is reverted to the previous role to which it was assigned.

The UBT fallback role is configurable at the port level. In deployments where a single controller or cluster setup is used, it is required to provide access to end clients even when the controller or the cluster failure occurs.

The application of the UBT fallback role depends on the authentication state of the client. That is, if the reauthentication of a client, with UBT fallback role applied, fails because of RADIUS reject or timeout reason, then the corresponding special role, reject or critical role, is applied.

Following are some of the scenarios where the UBT fallback role will be applied depending on the UBT operational state:

UBT Operational State	UBT Fallback Role Applied?
Down (UBT zone not ready)	Yes
Up (UBT zone ready)	No
Up --> Down (Controller not reachable)	Yes
Down --> Up (Controller reachable)	No
Up --> Down (UBT profile disabled)	Yes
Down --> Up (UBT profile enabled)	No
Up --> Down (MM/VSF switchover after 25 seconds)	Yes

- This configuration is supported in both UBT versions 1.0 and 2.0.
- UBT fallback role is assigned to only those clients within the UBT client limit. Any clients beyond this limit will not be associated with this role.
- When a client is already assigned with the UBT fallback role, you cannot remove the UBT fallback role configuration on a port. To remove the configuration, no clients must be associated with this role.
- Accounting stop and start events are generated when a client transitions from UBT role to a UBT fallback role.

Example

On the 6400 Switch Series, interface identification differs.

Configuring UBT fallback role on a port:

```
switch(config)# interface 1/1/3
switch(config-if)# port-access ubt-fallback-role fallback01
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.09	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show aaa authentication port-access interface client-status

```
show aaa authentication port-access interface {all | <IFRANGE>}
client-status [mac <MAC-ADDRESS>]
```

Description

Shows information about the status of the role applied on ports. RADIUS overridden user roles are suffixed with *. The role name is not displayed for clients that do not use local, downloaded, or RADIUS overridden role.

Parameter	Description
`all`	Specifies all interfaces.
<IFRANGE>	Specifies the interface name.
<MAC-ADDRESS>	Specifies the client MAC address.

Examples

Showing information about a client:

```
switch# show aaa authentication port-access interface all client-status
Port Access Client Status Details
RADIUS overridden user roles are suffixed with '*'
Client 00:50:56:96:93:d6, John Doe
============================

Session Details
---------------
Port         : 1/1/13
Session Time : 30s
```

```
IPv4 Address : 10.0.0.1
IPv6 Address :


Authentication Details
----------------------
Status          : dot1x Authenticated
Auth Precedence : dot1x - Authenticated, mac-auth - Not attempted
Auth History    : dot1x    - Authenticated, 5s ago
mac-auth - Unauthenticated, Server-Reject, 10s ago
mac-auth - Unauthenticated, Server-Reject, 15s ago
dot1x    - Unauthenticated, Server-Timeout, 15s ago
dot1x    - Attempted, 20s ago


Authorization Details
----------------------
Role   : Employee*
Status : Applied


Client 00:50:56:96:50:28
============================
Session Details
---------------
Port         : 1/1/14
Session Time : 10s
IPv4 Address : 10.0.0.2
IPv6 Address :


Authentication Details
----------------------
Status          : mac-auth Authenticated
Auth Precedence : dot1x - Unauthenticated, mac-auth - Authenticated
Auth History    : dot1x    - Unauthenticated, Server-Reject, 5s ago
mac-auth - Authenticated, 10s ago


Authorization Details
----------------------
Status : Applied
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command output modified to be suffixed with * for RADIUS overridden user roles. The role name will not be displayed for clients that do not use local, downloaded, or RADIUS overridden role.
10.08	Command output updated to display multidomain mode information
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access clients

```
show port-access clients [dhcp-info|ubt|vxlan] [interface <INTERFACE-NAME>] [mac <MAC-
ADDRESS>]
```

Description

Shows summarized active port access client information.

The **User-Role** column in the output will not display any value for clients not using local, downloaded or RADIUS overridden role. When an explicit client name is not available, only the MAC address of the client will be displayed.

The VLANs in the output display the tags, **u, t**, and **multi** to indicate untagged VLAN, single tagged VLAN, and multiple VLANs respectively.

Parameter	Description
dhcp	Shows DHCP information of port access clients. **NOTE:** To view the DHCP information of port access clients, either client IP tracker or DHCP snooping must be enabled. If client IP tracker is enabled, then the command does not display the lease time. This command does not display information about tagged VLAN.
ubt	Shows port access information about UBT clients. **NOTE:** The output displays information only about untagged VLAN.
vxlan	Shows port access information about VXLAN clients. **NOTE:** The output displays information about both tagged and untagged VLAN without the tags, **u** and **t**.
<INTERFACE-NAME>	Specifies the interface name.
<MAC-ADDRESS>	Specifies the client MAC address.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information about a specific client:

```
switch# show port-access clients mac 00:50:56:bd:50:43
Port Access Clients
RADIUS overridden user roles are suffixed with '*'

Flags: Onboarding-Method|Mode|Device-Type|Status

Onboarding-Method: 1x 802.1X, ma MAC-Auth, ps Port-Security, dp Device-Profile,m
Multi-Domain

Mode: c Client-Mode, d Device-Mode, , m Multi-Domain

Device-Type: d Data, v Voice

Status: s Success, f Failed, p In-Progress, d Role-Download-Failed

----------------------------------------------------------------------------------
---------------------------
Port     Client-Name              IPv4-Address    User-Role
  VLAN            Flags
----------------------------------------------------------------------------------
---------------------------
1/1/5    00:50:56:bd:50:43                        reject-role, reject
  (u)1234,(t)1000 1x|c|-|s
```

Showing information for clients on a particular interface:

```
switch# show port-access clients interface 1/1/5
Port Access Clients
RADIUS overridden user roles are suffixed with '*'

Flags: Onboarding-Method|Mode|Device-Type|Status

Onboarding-Method: 1x 802.1X, ma MAC-Auth, ps Port-Security, dp Device-Profile

Mode: c Client-Mode, d Device-Mode,  m Multi-Domain

Device-Type: d Data, v Voice

Status: s Success, f Failed, p In-Progress, d Role-Download-Failed

----------------------------------------------------------------------------------
---------------------------
Port     Client-Name              IPv4-Address    User-Role
  VLAN            Flags
----------------------------------------------------------------------------------
---------------------------
1/1/5    00:50:56:bd:32:07                        reject-role, reject
  (u)1234,(t)1000 1x|c|-|s
1/1/5    test                                     critical-..., critical
  (u)56           1x|c|-|f
1/1/9    00:50:56:bd:50:c7                        rp-role
                  rp|p|-|s
```

Showing DHCP information of port access clients:

```
switch# show port-access clients dhcp-info
Port Access Clients
----------------------------------------------------------------------------------
--------------
```

~~~~
Port     Client-Name             IP-Address
VLAN  Lease-Time
----------------------------------------------------------------------------------
--------------
1/1/1    Camera-1023             10.10.10.10                                   10
  268
1/1/2    CAP-8-G22               aaaa:bbbb:cccc:dddd:eeee:1234:5678:abcd       20
  500
```
~~~~

Showing port access information about UBT clients:

```
switch# show port-access clients ubt
Port Access Clients
RADIUS overridden user roles are suffixed with '*'

Flags: Onboarding-Method|Mode|Device-Type|Status

Onboarding-Method: 1x 802.1X, ma MAC-Auth, ps Port-Security, dp Device-Profile

Mode: c Client-Mode, d Device-Mode,m Multi-Domain

Device-Type: d Data, v Voice

Status: s Success, f Failed, p In-Progress, d Role-Download-Failed

----------------------------------------------------------------------------------
-------------------------------------
Port     Client-Name         IPv4-Address    User-Role               Gateway-Role
        UBT           VLAN  Flags
Zone
----------------------------------------------------------------------------------
-------------------------------------
1/1/12   00:50:56:96:93:d6   10.10.10.10     test_role               authenticated
        zone1         10    ma|c|-|s
1/1/10   CAP-8-G22           10.10.10.11     student
authenticated_gate... zone1         9857  1x|c|-|s
```

Showing port access information about VXLAN clients:

```
switch# show port-access clients vxlan
Port Access Clients
RADIUS overridden user roles are suffixed with '*'

Flags: Onboarding-Method|Mode|Device-Type|Status

Onboarding-Method: 1x 802.1X, ma MAC-Auth, ps Port-Security, dp Device-Profile

Mode: c Client-Mode, d Device-Mode, m Multi-Domain

Device-Type: d Data, v Voice

Status: s Success, f Failed, p In-Progress, d Role-Download-Failed

----------------------------------------------------------------------------------
----------------------
Port     Client-Name             IPv4-Address    User-Role
  VLAN  VNI  Flags
```

```
------------------------------------------------------------------------------------
----------------------
1/1/21   00:50:56:96:93:d6       10.10.10.10     student
  5678  2432 ma|c|-|s
1/1/21   user_12@gmail.com                       employee
  9857  4678 1x|c|-|s
```

Command History

Release	Modification
10.12	The following changes were introduced: ■ The **dhcp-info**, **ubt**, and **vxlan** parameters were introduced. ■ Command output modified to display only **Port**, **Client-Name**, **IPv4-Address**, **User-Role**, **VLAN,** and **Flags.**
10.08	Command output updated to display multidomain mode information
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access clients detail

```
show port-access clients [interface <INTERFACE-NAME>] [mac <MAC-ADDRESS>] detail
```

Description

Shows detailed active port access clients information including the VLAN group and VLAN association for each of the authenticated clients. The output can be filtered by interface or MAC address.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface name.
<MAC-ADDRESS>	Specifies the client MAC address.

Examples

On the 6400 Switch Series, interface identification differs.

Showing detailed information for clients on a particular interface:

```
switch# show port-access clients interface 1/1/7-1/1/8 detail
Port Access Client Status Details:
```

```
---------------------------------

RADIUS overridden user roles are suffixed with '*'

Client 2c:41:38:7f:35:b9, John Doe
============================
Session Details
---------------
Port         : 1/1/7
Session Time : 203s
IPv4 Address : 10.10.10.10
IPv6 Address :

Authentication Details
----------------------
Status          : mac-auth Authenticated
Auth Precedence : dot1x - Unauthenticated, mac-auth - Authenticated
Auth History    : mac-auth - Authenticated, 5s ago
dot1x    - Unauthenticated, Server-Reject, 10s ago

Authorization Details
----------------------
Status : Applied


RADIUS Attributes
------------------
User-Name                     : Student
Filter-ID                     : DHCP, WebServices-Student, DataCenter-Student,
RemoteAccess-Student, Printer-Student
Framed-MTU                    : 1500 bytes
Session-Timeout               : 500 seconds
Idle-Timeout                  : 200 seconds
Termination-Action            : RADIUS-Request
Egress-VLAN-ID                : 10(t), 15(t), 20(u)
Egress-VLAN-Name              : VLAN100(t), VLAN200(u)
Tunnel-Type                   : 13
Tunnel-Medium-Type            : 6
Tunnel-Private-Group-ID       : 20
NAS-Filter-Rule               : permit in 17 from any to any
deny in tcp from any to 10.10.10.3/8
Aruba-Captive-Portal-URL      : http://arubanetworks.com/student/captiveportal.php
Aruba-PoE-Priority            : Low
Aruba-Port-Auth-Mode          : client-mode
Aruba-NAS-Filter-Rule         : deny in icmp from 10.10.10.1 to any 27
Aruba-QoS-Trust-Mode          : dscp
Aruba-UBT-Gateway-Role        : gateway_student_role
Aruba-Gateway-Zone            : student_zone
Aruba-STP-Admin-Edge-Port     : false
Aruba-UBT-Gateway-CPPM-Role   : ubt_gateway_cppm_student_role
Aruba-Device-Traffic-Class    : data
Aruba-PVLAN-Port-Type         : secondary
Aruba-PoE-Allocate-By-Method  : class
RADIUS Role Name : RADIUS_115315236
```

Showing information for a particular client MAC address:

```
switch# show port-access clients mac 2c:41:38:7f:35:c8 detail
Port Access Client Status Detail
--------------------------------
RADIUS overridden user roles are suffixed with '*'
```

```
Client 2c:41:38:7f:35:c8, John Doe
============================

Session Details
---------------
Port         : 1/1/8
Session Time : 33s
IPv4 Address :
IPv6 Address :


VLAN Details
---------------
VLAN Group Name :
VLANs Assigned  : 10,20,30
Access          :
Native Untagged : 10
Alllowed Trunk  : 20,30


Authentication Details
----------------------
Status          : mac-auth Authenticated
Auth Precedence : dot1x - Unauthenticated, mac-auth - Authenticated
Auth History    : mac-auth - Authenticated, 5s ago
dot1x    - Unauthenticated, Server-Timeout, 10s ago


Authorization Details
----------------------
Role   : student
Status : Applied
Role Information:
-----------------
Name  : student
Type  : local
----------------------------------------------
Reauthentication Period             : 333 secs
Authentication Mode                 : device
Native VLAN                         : 10
Allowed Trunk VLANs                 : 20,30
PoE Allocation method               : usage
PoE Priority                        : low
Captive Portal Profile              : testcpprof_29451201
Policy                              : PERMIT-ALL_87364653


Captive Portal Profile Configuration:
------------------------------------
Name                            : testcpprof_29451201
Type                            : local
URL                             : http://google.com
URL Hash Key                    : SWNGWyMeYubHPDgVIirpEUwNK5Uf+r1vmhBIncQPw1Y=


Access Policy Details:
---------------------
Policy Name   : PERMIT-ALL_87364653
Policy Type   : Local
Policy Status : Applied
Base Policy   : N/A
ACL Names     : N/A
```

```
SEQUENCE    CLASS                         TYPE ACTION
----------- ----------------------------- ---- ----------------------------------
10          dns                           ipv4 permit
20          dhcp                          ipv4 permit


Class Details:
-------------
class ip dns
10 match tcp any any
class ip dhcp
20 match any any any
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	The following changes were introduced: ■ Command output modified to display RADIUS attributes for clients not using local, downloaded or RADIUS overridden role. ■ Command output modified to display **Base Policy** and **ACL Names.** ■ Command output modified to display **PoE Allocation method**.
10.08	Added RADIUS overridden role to example
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access clients onboarding-method

```
show port-access clients onboarding-method <METHOD>
```

Description

Shows active port access client information for the specified onboarding method.

Parameter	Description
<METHOD>	Selects the onboarding method. Available methods: **device-profile**, **dot1x**, **mac-auth**, **port-security**.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for clients onboarded using MAC authentication.

```
switch# show port-access clients onboarding-method mac-auth

Port Access Clients

Status codes: device-mode

--------------------------------------------------------------------------------
-
   Port      MAC-Address        Onboarding      Status       Role
                                Method
--------------------------------------------------------------------------------
-
   1/1/6     00:50:56:bd:50:43  mac-auth        Success      auth-role, auth
   1/1/212   00:60:56:bd:50:43  mac-auth        Success      fallback-role,
fallback
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access interface

```
show port-access interface all|<ifrange> status
```

Description

Display the interface status for port-access enabled interfaces. It includes the name of the port, the member interfaces associated with the port along with the security state of the interface.

A port-access interface can be in one of the following states:

1. Blocked: Indicates that the interface is blocked by port-access.
2. Secured: Indicates the interface is secured by port-access.
3. Down: Indicates port-access is not yet operational on the interface

Parameter	Description
all	Display port-access information for all interfaces.
<ifrange>	Display port-access information for the specified interface.

Examples

Showing the port-access status for all interfaces:

```
switch# show port-access interface all status
Port      Interface  Status
--------- ---------- -------
1/1/1     1/1/1      Blocked
lag1      1/1/3      Secured
lag1      1/1/4      Down
```

Showing port-access status for interface 1/1/1:

```
switch# show port-access interface 1/1/1 status
Port      Interface  Status
--------- ---------- -------
1/1/1     1/1/1      Blocked
```

Showing port-access status for LAG 1:

```
switch# show port-access interface lag1 status
Port      Interface  Status
--------- ---------- -------
lag1      1/1/3      Secured
lag1      1/1/4      Down
```

When port-access is not configured on an interface, following message will be displayed:

```
switch# show port-access interface all status
Port-access is not configured
```

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 118

Port access MAC authentication commands

aaa authentication port-access allow-lldp-auth [mac {source-mac|chassis-mac}]

```
aaa authentication port-access allow-lldp-auth [mac {source-mac|chassis-mac}]
[no] aaa authentication port-access allow-lldp-auth [mac {source-mac|chassis-mac}]
```

Description

By default authentication is allowed via LLDP packets which are received on the port. Use the **no** version of this command to prevent authentication using LLDP packets received on the port. Chassis MAC and Source MAC addresses can be used for authentication via LLDP frames.

Examples

Configuring authentication via LLDP packets:

```
switch(config)# interface  1/1/1
switch(config-if)# aaa authentication port-access allow-lldp-auth
< pd platform="4100i,6000,6100,6200,6300,6400,8100,8360" >
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access allow-lldp-auth
< /pd >
```

Enabling authentication via LLDP packets on a MAC source:

```
switch(config)# interface  1/1/1
switch(config-if)# aaa authentication port-access allow-lldp-auth mac
source-mac

switch(config-if)# aaa authentication port-access allow-lldp-auth mac
chassis-mac
```

Enabling authentication via LLDP BDU packets:

```
switch(config-if)# aaa authentication port-access
allow-lldp-auth          Allow or block authentication on LLDP BPDU. (Default:
allow)

switch(config-if)# no aaa authentication port-access
allow-lldp-auth          Allow or block authentication on LLDP BPDU. (Default:
allow)

switch(config-if)# aaa authentication port-access allow-lldp-auth
switch(config-if)# no aaa authentication port-access allow-lldp-auth
```

Configuring MAC via LLDP packets:

```
switch(config-if)# aaa authentication port-access allow-lldp-auth
mac       Configure the MAC to use for LLDP based authentication (Default: chassis-
mac)

switch(config-if)# aaa authentication port-access allow-lldp-auth mac
chassis-mac      Use the chassis MAC in LLDP TLV.
source-mac       Use the source MAC in the LLDP frame.
```

Disabling authentication via LLDP packets on a MAC source:

```
switch(config-if)# no aaa authentication port-access allow-lldp-auth mac
chassis-mac      Use the chassis MAC in LLDP TLV.
source-mac       Use the source MAC in the LLDP frame.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth

```
aaa authentication port-access mac-auth {enable | disable}
no aaa authentication port-access mac-auth {enable | disable}
```

Description

Enables or disables MAC authentication globally or at the port-level.

Examples

Enabling MAC authentication on all interfaces:

```
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# enable
```

Disabling MAC authentication on all interfaces:

```
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# disable
```

Enabling MAC authentication on an interface:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# enable
```

Disabling MAC authentication on an interface:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# disable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config config-if	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth addr-format

```
aaa authentication port-access mac-auth addr-format {no-delimiter | single-dash |
     multi-dash |multi-colon | no-delimiter-uppercase | single-dash-uppercase |
     multi-dash-uppercase | multi-colon-uppercase}
no aaa authentication port-access mac-auth addr-format {no-delimiter | single-dash |
       multi-dash |multi-colon | no-delimiter-uppercase | single-dash-uppercase |
       multi-dash-uppercase | multi-colon-uppercase}
```

Description

Configures the MAC address format that the switch must use in the RADIUS request message.

The **no** form of the command resets the MAC address format to the default, **no-delimiter**.

Examples

Setting the MAC address format on the switch:

```
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# addr-format single-dash
```

Resetting the MAC address format on the switch to its default:

```
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# no addr-format
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth auth-method

```
aaa authentication port-access mac-auth auth-method {chap | pap}
no aaa authentication port-access mac-auth auth-method
```

Description

Configures the RADIUS authentication method for MAC authentication.

Following are the MAC authentication methods supported:

- CHAP
- PAP

The PEAP-MSCHAPv2 method of authentication is not supported.

The **no** form of the command resets the authentication method to the default, **chap**.

Examples

Configuring the RADIUS authentication method on the switch:

```
switch# config
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# auth-method pap
```

Resetting the RADIUS authentication method on the switch:

```
switch(config)# no aaa authentication port-access mac-auth auth-method
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth cached-reauth

```
aaa authentication port-access mac-auth cached-reauth
no aaa authentication port-access mac-auth cached-reauth
```

Description

Enables cached reauthentication on a port. Cached reauthentication allows MAC reauthentications to succeed when the RADIUS server is unavailable. Users who are already authenticated, retain their currently assigned RADIUS attributes.

The **no** form of the command disables cached reauthentication.

Examples

Enabling cached reauthentication on a port:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# cached-reauth
```

Disabling cached reauthentication on a port:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# no cached-reauth
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth cached-reauth-period

```
aaa authentication port-access mac-auth cached-reauth-period <PERIOD>
no aaa authentication port-access mac-auth cached-reauth-period
```

Description

Configures the period during which an authenticated client, which has failed to reauthenticate because the RADIUS server is unreachable, remains authenticated.

The **no** form of the command resets the cached reauthentication period to the default, 3600 seconds.

Parameter	Description
<PERIOD>	Specifies the cached reauthentication period (in seconds). Default: 3600. Range: 1 to 4294967295.

Examples

Configuring cached reauthentication period on a port:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# cached-reauth-period 300
```

Resetting the cached reauthentication period to the default value:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# no cached-reauth-period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth password

```
aaa authentication port-access mac-auth password {plaintext|ciphertext}<PASSWORD>
no aaa authentication port-access mac-auth password
```

Description

Enables and configures the global password that the switch must use for MAC authentication. The password can be either in ciphertext or plaintext format.

The **no** form of the command disables the password for MAC authentication.

Parameter	Description
`{plaintext|ciphertext}<PASSWORD>`	Specifies the global password to be used by all MAC authenticating devices in either plaintext or ciphertext format.

Examples

Setting the MAC authentication password:

```
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# password plaintext maX99J#
```

Disabling the MAC authentication password:

```
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# no password
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth quiet-period

```
aaa authentication port-access mac-auth quiet-period <PERIOD>
no aaa authentication port-access mac-auth quiet-period
```

Description

Configures the period during which the switch does not try to authenticate a rejected client.

The **no** form of the command resets the quiet period to the default, 60 seconds.

Parameter	Description
<PERIOD>	Specifies the quiet period (in seconds). Default: 60. Range: 0 to 65535.

Examples

Configuring the quiet period on a port:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# quiet-period 65
```

Resetting the quiet period on a port to default:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# no quiet-period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth radius server-group

```
aaa authentication port-access mac-auth radius server-group <GROUP-NAME>
no aaa authentication port-access mac-auth radius server-group <GROUP-NAME>
```

Description

Configures the MAC authentication server group globally or for a particular port.

The **no** form of the command resets the authentication server group to the default value, **radius**.

When configured on a port, the **no** form of the command resets the server group on that port to the globally configured group. If no global RADIUS server group is configured, the **no** form of the command resets the configuration to the default group, **radius**.

When the RADIUS server group for MAC authentication is updated on a port, any existing clients on the port that were authenticated using the previous globally configured group will associate with the new group for the port during the next re-authentication cycle. Any new client that is onboarding on the port after the server group update will associate with the new group immediately.

Parameter	Description
<GROUP-NAME>	Specifies the name of the MAC authentication server group.

Examples

Configuring the RADIUS server group for MAC authentication globally:

```
switch# config
switch(config)# aaa authentication port-access mac-auth
switch(config-macauth)# radius server-group group1
```

Configuring the RADIUS server group for MAC authentication on **1/1/5**:

```
switch(config)# interface 1/1/5
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# radius server-group group2
```

Resetting the RADIUS server group configuration on **1/1/5**:

```
switch(config)# interface 1/1/5
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# no radius server-group
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command is now configurable on a port
10.07 or earlier	--

Command Information

Platforms	Command context	Authority

6300
6400
	`config`
	`config-macauth`
	`config-if-macauth`
		Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth reauth

```
aaa authentication port-access mac-auth reauth
no aaa authentication port-access mac-auth reauth
```

Description

Enables periodic MAC reauthentication of authenticated clients on the port.

The **no** form of the command disables periodic MAC reauthentication on the port.

Examples

Enabling reauthentication on a port:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# reauth
```

Disabling reauthentication on a port:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# no reauth
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

aaa authentication port-access mac-auth reauth-period

```
aaa authentication port-access mac-auth reauth-period <PERIOD>
no aaa authentication port-access mac-auth reauth-period
```

Description

Configures the period after which MAC authenticated clients must be reauthenticated on the port. You must first enable MAC reauthentication on the port before configuring the MAC reauthentication period.

The **no** form of the command resets the MAC reauthentication period to the default, 3600 seconds.

Parameter	Description
<PERIOD>	Specifies the MAC reauthentication period (in seconds). Default: 3600. Range: 1 to 4294967295.

Examples

Configuring the MAC reauthentication period on a port:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# reauth-period 60
```

Resetting the MAC reauthentication period to its default:

```
switch(config-if)# aaa authentication port-access mac-auth
switch(config-if-macauth)# no reauth-period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

clear mac-auth statistics

```
clear mac-auth statistics [interface <IF-NAME>]
```

Description

Clears the MAC authentication statistics associated with the port and all the authenticator state machines associated to this port.

If no interface is specified, the statistics is cleared for all MAC authentication enabled ports.

Parameter	Description
<IF-NAME>	Specifies the interface name.

Examples

Clearing MAC authentication statistics on a port (6400 Switch Series):

```
switch# clear mac-auth statistics interface 1/3/1
```

Clearing MAC authentication statistics on all ports:

```
switch# clear mac-auth statistics
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authentication port-access mac-auth interface client-status

```
show aaa authentication port-access mac-auth interface {all|<IF-NAME>}
 client-status [mac <MAC-ADDRESS>]
```

Description

Shows information about MAC authentication clients status. The output can be filtered by interface or MAC address.

Parameter	Description
all	Specifies all interfaces.
<IF-NAME>	Specifies the interface name.
<MAC-ADDRESS>	Specifies the client MAC address.

Examples

On the 6400 Switch Series, interface identification differs.

Showing client status information for all ports:

```
switch# show aaa authentication port-access mac-auth interface all client-status

```

```
Port Access Client Status Details

Client  AB:CD:DE:FF:AA:BB, 1/1/1
=========================================
  Authentication Details
  ----------------------
    Status                                 : Authenticated
    Type                                   : Pass-Through
    Auth-Method                            : CHAP
    Time Since Last State Change           : 10 secs

  Authentication Statistics
  -------------------------
        Authentication                 : 1
  Authentication Timeout         : 0
  Successful Authentication      : 1
  Failed Authentication          : 0
  Re-Authentication              : 0
  Successful Re-Authentication   : 0
  Failed Re-Authentication       : 0
        Re-Auths When Authenticated    : 0
  Cached Re-Authentication       : 0

Client  DD:CD:AB:CS:EE:OI, 1/1/2
=========================================
  Authentication Details
  ----------------------
    Status                                 : Unauthenticated
    Type                                   : Pass-Through
    Auth-Method                            : CHAP
    Auth Failure reason                    : Server reject/ Server timeout
    Time Since Last State Change           : 15 secs

  Authentication Statistics
  -------------------------
  Authentication                : 1
  Authentication Timeout        : 0
  Successful Authentication     : 0
  Failed Authentication         : 1
  Re-Authentication             : 0
  Successful Re-Authentication  : 0
  Failed Re-Authentication      : 0
  Re-Auths When Authenticated   : 0
  Cached Re-Authentication      : 0
```

Showing status information for a client:

```
switch# show aaa authentication port-access mac-auth interface 1/1/1 client-status
mac ab:cd:de:ff:aa:bb

Port Access Client Status Details

Client  AB:CD:DE:FF:AA:BB, 1/1/1
=========================================
  Authentication Details
  ----------------------
    Status                                 : Authenticated
    Type                                   : Pass-Through
    Auth-Method                            : CHAP
    Time Since Last State Change           : 10 secs
```

```
Authentication Statistics
-------------------------
     Authentication                 : 1
Authentication Timeout        : 0
Successful Authentication     : 1
Failed Authentication         : 0
Re-Authentication             : 0
Successful Re-Authentication  : 0
Failed Re-Authentication      : 0
     Re-Auths When Authenticated   : 0
Cached Re-Authentication      : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show aaa authentication port-access mac-auth interface port-statistics

```
show aaa authentication port-access mac-auth interface {all|<IF-NAME>} port-statistics
```

Description

Shows information about MAC authentication ports. The output can be filtered by interface.

Parameter	Description
`all`	Specifies all interfaces.
`<IF-NAME>`	Specifies the interface name.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for all ports.

```
switch# show aaa authentication port-access mac-auth interface all port-statistics

Port 1/1/1
```

```
==========

  Client Details
  --------------
    Number of Clients                 : 3
    Number of authenticated clients   : 2
    Number of unauthenticated clients : 1
    Number of authenticating clients  : 0

Port 1/1/2
==========

  Client Details
  --------------
    Number of Clients                 : 4
    Number of authenticated clients   : 2
    Number of unauthenticated clients : 2
    Number of authenticating clients  : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 119

Port access policy commands

port-access policy

```
port-access policy <POLICY-NAME>
   [<SEQUENCE-NUMBER>]
   class {ip|ipv6} <CLASS-NAME> action {<REMARK-ACTIONS> | <POLICE-ACTIONS> | <OTHER-
   ACTIONS>}
   comment <text>
```

Description

Creates or modifies a policy and policy entries. A policy is made up of one or more policy entries ordered and prioritized by sequence numbers. Each entry has an IPv4/IPv6 class and one or more policy actions associated with it.

A policy must be applied to a role using the **associate policy** command.

The **no** form of the command can be used to delete either a policy (use **no** with the policy command) or an individual policy entry (use **no** with the sequence number).

Parameter	Description
<POLICY-NAME>	Specifies the policy name.
<SEQUENCE-NUMBER>	Specifies the policy entry sequence number. Range: 1 to 4294967295.
`class {ip|ipv6}` *<CLASS-NAME>*	Specifies the class type and name.
<REMARK-ACTIONS>	These remark actions are available: `ip-precedence <IP-PRECEDENCE-VALUE>` Specifies the numeric IP precedence value. Range: 0 to 7. `dscp` *<DSCP-VALUE>* Specifies a Differentiated Services Code Point (DSCP) value. Enter either a keyword or numeric value (0 to 63). See *DSCP keywords and corresponding values* below. `pcp` *<PCP-VALUE>* Specifies a pcp value. `local-priority` *<LOCAL-PRIORITY-VALUE>* Specifies a local priority value. Range: 0 to 7.
<POLICE-ACTIONS>	These police actions are available: `cir kbps` *<RATE-KBPS>* Specifies a Committed Information Rate (CIR) value in kbps. Range: 1 to 4294967295. `cbs` *<BYTES>* Specifies a Committed Burst Size (CBS) value in bytes. Range: 1 to 4294967295.

Parameter	Description
	`exceed` Specifies the action to take on packets that exceed the rate limit.

`<OTHER-ACTIONS>`	These other actions are available:
	`drop`
	Selects drop of all traffic.
	`redirect`
	Selects redirect of all traffic to a captive portal server.
	`reflect`
	Enables the switch to allow a packet destined to the client only if the flow is learned (the flow is initiated by the client).

`comment`	Specifies a policy entry comment.

DSCP keywords and corresponding values

Keyword	Value	Description
`AF11`	10	DSCP 10 (Assured Forwarding Class 1, low drop probability)
`AF12`	12	DSCP 12 (Assured Forwarding Class 1, medium drop probability)
`AF13`	14	DSCP 14 (Assured Forwarding Class 1, high drop probability)
`AF21`	18	DSCP 18 (Assured Forwarding Class 2, low drop probability)
`AF22`	20	DSCP 20 (Assured Forwarding Class 2, medium drop probability)
`AF23`	22	DSCP 22 (Assured Forwarding Class 2, high drop probability)
`AF31`	26	DSCP 26 (Assured Forwarding Class 3, low drop probability)
`AF32`	28	DSCP 28 (Assured Forwarding Class 3, medium drop probability)
`AF33`	30	DSCP 30 (Assured Forwarding Class 3, high drop probability)
`AF41`	34	DSCP 34 (Assured Forwarding Class 4, low drop probability)
`AF42`	36	DSCP 36 (Assured Forwarding Class 4, medium drop probability)
`AF43`	38	DSCP 38 (Assured Forwarding Class 4, high drop probability)
`CS0`	0	DSCP 0 (Class Selector 0: Default)
`CS1`	8	DSCP 8 (Class Selector 1: Scavenger)
`CS2`	16	DSCP 16 (Class Selector 2: OAM)
`CS3`	24	DSCP 24 (Class Selector 3: Signaling)

Keyword	Value	Description
CS4	32	DSCP 32 (Class Selector 4: Real time)
CS5	40	DSCP 40 (Class Selector 5: Broadcast video)
CS6	48	DSCP 48 (Class Selector 6: Network control)
CS7	56	DSCP 56 (Class Selector 7)
EF	46	DSCP 46 (Expedited Forwarding)

Usage

- An applied policy processes the packet sequentially against policy and class entries in the list, until either the last policy entry in the list has been evaluated or the packet matches an entry. If there is no match, the packet will be dropped by one of the implicit **deny all** IPv4 and IPv6 entries.
- Entering an existing **<POLICY-NAME>** value will cause the existing policy to be modified, with any new **<SEQUENCE-NUMBER>** value creating an additional policy entry, and any existing **<SEQUENCE-NUMBER>** value replacing the existing policy entry with the same sequence number.
- If no sequence number is specified, a new policy entry will be appended to the end of the entry list with a sequence number equal to the highest policy entry currently in the list plus 10. The sequence numbers may be reordered with the **port-access policy <POLICY-NAME> resequence <STARTING-SEQ-NUM> <INCREMENT>** command.
- If a policy is configured without any action, the default action, **permit**, is applied for that policy.

Examples

Creating a policy with several class entries:

```
switch(config)# port-access policy POL1
switch(config-pa-policy)# 10 class ip dns
switch(config-pa-policy)# 20 class ip dhcp
switch(config-pa-policy)# 30 class ip test action cir kbps 1024 exceed drop
switch(config-pa-policy)# exit
switch(config)# show port-access policy POL1

Access Policy Details:
======================

Policy Name   : POL1
Policy Type   : Local
Policy Status :
SEQUENCE    CLASS                       TYPE ACTION
----------- --------------------------- ---- ----------------------------------
10          dns                         ipv4 permit
20          dhcp                        ipv4 permit
30          test                        ipv4 cir kbps 1024 cbs 2048 exceed drop
```

Adding a comment to an existing class entry:

```
switch(config)# port-access policy POL1
switch(config-pa-policy)# 20 comment DHCP-PERMIT
switch(config-pa-policy)# exit
switch(config)# show run port-access policy POL1

port-access policy POL1
    10 class ip dns
    20 class ip dhcp
    20 comment DHCP-PERMIT
    30 class ip test action cir kbps 1024 cbs 2048     exceed drop
```

Removing a comment from an existing class entry:

```
switch(config)# port-access policy POL1
switch(config-pa-policy)# no 20 comment
switch(config-pa-policy)# exit
switch(config)# show run port-access policy POL1

port-access policy POL1
    10 class ip dns
    20 class ip dhcp
    30 class ip test action cir kbps 1024 cbs 2048 exceed drop
```

Modifying a policy by replacing one class with another at the same sequence number:

```
switch(config)# port-access policy POL1
switch(config-pa-policy)# 10 class ip mds action dscp af21
switch(config-pa-policy)# exit
switch(config)# show port-access policy POL1

Access Policy Details:
======================

Policy Name   : POL1
Policy Type   : Local
Policy Status : Applied

SEQUENCE    CLASS                        TYPE ACTION
----------- ---------------------------- ---- ----------------------------------
10          mds                          ipv4 dscp AF21
20          dhcp                         ipv4 permit
30          test                         ipv4 cir kbps 1024 cbs 2048 exceed drop
```

Removing a class:

```
switch(config)# port-access policy POL1
switch(config-pa-policy)# no 10
switch(config-pa-policy)# exit
switch(config)# show port-access policy POL1

Access Policy Details:
======================

Policy Name   : POL1
Policy Type   : Local
Policy Status : Applied

SEQUENCE    CLASS                        TYPE ACTION
----------- ---------------------------- ---- ----------------------------------
```

```
20          dhcp                         ipv4 permit
30          clearpass-web                ipv4 cir kbps 1024 cbs 2048 exceed drop
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config` The `policy` command takes you into the `config-pa-policy` context where you enter the policy entries.	Administrators or local user group members with execution rights for this command.

port-access policy copy

`port-access policy <POLICY-NAME> copy <DESTINATION-POLICY>`

Description

Copies an existing policy to a new policy.

Parameter	Description
<POLICY-NAME>	Specifies the existing policy name.
<DESTINATION-POLICY>	Specifies the destination policy name.

Examples

Copying a policy:

```
switch(config)# port-access policy POL1 copy POL1_copy
switch(config)# show port-access policy

Access Policy Details:
======================

Policy Name   : POL1
Policy Type   : Local
Policy Status : Applied

SEQUENCE    CLASS                       TYPE ACTION
----------- --------------------------- ---- ----------------------------------
```

```
20          dhcp                        ipv4 permit
30          test                        ipv4 cir kbps 1024 exceed drop

Policy Name   : POL1_copy
Policy Type   : Local
Policy Status : Applied

SEQUENCE    CLASS                       TYPE ACTION
----------- --------------------------- ---- -----------------------------------
20          dhcp                        ipv4 permit
30          test                        ipv4 cir kbps 1024 exceed drop
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

port-access policy resequence

`port-access policy <POLICY-NAME> resequence <STARTING-SEQ-NUM> <INCREMENT>`

Description

Resequences numbering in a policy.

Parameter	Description
<POLICY-NAME>	Specifies the policy to be resequenced.
<STARTING-SEQ-NUM>	Specifies the starting sequence number. Range: 1 to 4294967295.
<INCREMENT>	Specifies the sequence number increment.

Examples

Resequencing a policy starting at 5 with an increment of 10:

```
switch(config)# port-access policy POL1 resequence 5 10
switch(config)# show port-access policy POL1

Access Policy Details:
======================
Policy Name   : POL1
Policy Type   : Local
Policy Status : Applied

SEQUENCE    CLASS                       TYPE ACTION
----------- --------------------------- ---- ----------------------------------
5           dhcp                        ipv4 permit
15          test                        ipv4 cir kbps 1024 exceed drop
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

port-access policy reset

`port-access policy <POLICY-NAME> reset`

Description

Resets the policy configuration to match the current hardware configuration of the policy.

Parameter	Description
<POLICY-NAME>	Specifies the name of the policy to be reset.

Examples

Resetting a policy:

```
switch(config)# port-access policy POL2
switch(config-pa-policy)# 20 class ip dhcp
switch(config-pa-policy)# 40 class test2 action cir kbps 1024 exceed drop
switch(config-pa-policy)# exit
switch(config)# show port-access policy POL1-V2

Access Policy Details:
======================

Policy Name   : POL2
Policy Type   : Local
Policy Status : Applied

SEQUENCE    CLASS                        TYPE ACTION
----------- ---------------------------- ---- -----------------------------------
20          dhcp                         ipv4 permit
40          test2                        ipv4 cir kbps 1024 exceed drop

switch(config)# port-access policy POLV2
switch(config-pa-policy)# 50 class ip test3 action cir kbps 1024 exceed drop
switch(config-pa-policy)# no 20
switch(config-pa-policy)# exit
switch(config)# show port-access policy POL2

Access Policy Details:
======================

Policy Name   : POL2
Policy Type   : Local
Policy Status : Rejected

SEQUENCE    CLASS                        TYPE ACTION
----------- ---------------------------- ---- -----------------------------------
40          test2                        ipv4 cir kbps 1024 exceed drop
50          test3                        ipv4 cir kbps 1024 exceed drop

switch(config)# port-access policy POK2 reset
Following policy entries will be removed:
class ip test3 action cir kbps 1024 exceed drop

Following policy entries will be added:
20 class ip dhcp

Do you want to continue (y/n)? y
switch(config)# show port-access policy POL2

Access Policy Details:
======================

Policy Name   : POL1-V2
Policy Type   : Local
Policy Status : Applied

SEQUENCE    CLASS                        TYPE ACTION
----------- ---------------------------- ---- -----------------------------------
20          dhcp                         ipv4 permit
40          test2                        ipv4 cir kbps 1024 exceed drop
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

port-access reflexive

```
port-access reflexive
   {gbp|policy} enable
   no...
```

Description

This command enables the use of reflexive port access and group-based policies.

Regular stateless policies allow or deny traffic in the ingress or the egress direction. As a result, reverse traffic that belongs to the same flow will require a separate policy in the opposite direction. This can require complex policies that can be difficult to manage. When reflexive port access policies are enabled, the switch maintains an internal flow table for permitted traffic, and automatically allows return traffic for permitted flows.

When reflexive port access or group-based policies are enabled using this command, all existing port-access clients associated with a reflexive port-access policy, application based policy or group-based policy are logged off from the system.

The **no** form of the command disables reflexive policies and returns port access and group-based policies to the regular stateless status.

This feature can only be used with TCP/UDP Unicast traffic protocols. Protocols like TFTP, DHCP, and ICMP that use a different IP address or port in the request and the corresponding response must not be configured as a reflect entry.

Parameter	Description
`gbp`	Enables reflexive group-based policies.
`policy`	Enables reflexive port access policies.

Prerequisites

Before you can enable reflexive policies, you must first configure a role ID using the following command:

```
switch(config)# gbp role <ROLE_NAME> <ROLE_ID>
```

Next,, enable flow tracking using the following commands:

```
switch(config)# no ip source-lockdown resource-extended
   Do you want to continue (y/n)? y
switch(config)# flow-tracking
switch(config-flow-tracking)# enable
```

Examples

Enable reflexive port-access policies:

```
switch(config)# port-access reflexive policy enable
```

Enable reflexive group-based policies:

```
switch(config)# port-access reflexive gbp enable
```

Creating a policy with two entries with reflexive action:

```
switch(config)# port-access policy CPPM
switch(config-pa-policy)# 10 class ip dns action reflect
switch(config-pa-policy)# 20 class ip ssh action reflect
switch(config-pa-policy)# 30 class ip clearpass-web action cir kbps 1024 cbs 2048
exceed drop
switch(config-pa-policy)# 40 class ip web-traffic action redirect captive-portal
switch(config-pa-policy)# exit
switch(config)# show port-access policy

Access Policy Details:
======================

Policy Name   : CPPM
Policy Type   : Local
Policy Status : Applied

SEQUENCE     CLASS           TYPE ACTION
-------- ------------ ---- ---------------------------
10        dns                ipv4 reflect
20        ssh                ipv4 reflect
30        clearpass-web      ipv4 cir kbps 1024 cbs 2048 exceed drop
40        web-traffic        ipv4 redirect captive-portal
```

The **Reflect** action enables the switch to allow a packet destined to the client only if the flow is learned, that is, the flow is initiated by the client.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority

6300
6400v2
	`config`
	`config-class-<CLASS-TYPE>`
		Administrators or local user group members with execution rights for this command.

clear port-access policy hitcounts

`clear port-access policy <POLICY-NAME> hitcounts {port|client}`

Description

Clears statistics and conform rate of a policy applied on a port or client.

Parameter	Description
<POLICY-NAME>	Specifies the policy name.
port	Selects port mode.
client	Selects client mode.

Examples

Clearing policy hit counts:

```
switch# show port-access policy POL6 hitcounts port

Port Access Policy Hit-Counts Details:
======================================

Policy Name   : POL4
Policy Type   : Local
Policy Status : Applied

SEQUENCE CLASS             TYPE ACTION                            CUR-RATE(kbps)
-------- ----------------- ---- --------------------------------- --------------
3        test8             ipv4 cir kbps 1024 exceed drop         512

Class Name : dhcp
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match icmp any any count                                0

Class Name : clearpass-web
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
15          match udp any any count                                 15101830

Class Name : web-traffic
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match any any any count                                 241
20          match any 10.1.1.1 10.1.1.2 dscp AF11 count             50

Class Name : class6
Class Type : ipv6

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match any any any count                                 173
20          match icmpv6 2001:db8:a::123 2001:db8:a::125 dscp AF11
             count                                                  32
switch#
switch# clear port-access policy POL6 hitcounts port
switch#
switch# show port-access policy POL6 hitcounts port
```

```
Port Access Policy Hit-Counts Details:
======================================

Policy Name   : POL4
Policy Type   : Local
Policy Status : Applied

SEQUENCE CLASS             TYPE ACTION                            CUR-RATE(kbps)
--------- ----------------- ---- --------------------------------- ---------------
3        test8             ipv4 cir kbps 1024 exceed drop         512

Class Name : dhcp
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match icmp any any count                                0

Class Name : clearpass-web
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
15          match udp any any count                                 0

Class Name : web-traffic
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match any any any count                                 0
20          match any 10.1.1.1 10.1.1.2 dscp AF11 count             0

Class Name : class6
Class Type : ipv6

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match any any any count                                 0
20          match icmpv6 2001:db8:a::123 2001:db8:a::125 dscp AF11
             count                                                  0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access policy

`show port-access policy [<POLICY-NAME>]`

Description

Shows various aspects of policies and their current usage. Details of a policy including the content of a specific policy is shown.

Policy type values:

- **Local**—User configured policy
- **Downloaded**—Downloaded user policy
- **RADIUS**—Policy obtained from the RADIUS server

Policy status values:

- **Applied**—Policy is successfully applied in the hardware.
- **Rejected**—Policy is not supported in the hardware.
- **In-Progress**—Policy is being processed in the hardware.
- **Failed**—Displayed when the switch fails to apply the policy configuration because the TCAM resources are unavailable or full.

Base Policy Values:

- **Name of the policy**—Policy associated with the RADIUS overridden base role.
- **N/A**—Non-RADIUS policy or policy derived from RADIUS attributes such as Filter ID or [Aruba-]NAS-Filter-Rule

ACL Names Values:

- **Name of the ACL**—Name of the ACL associated with the RADIUS policy derived from RADIUS Filter-ID attribute.
- **N/A**—Non-RADIUS policy or policy derived from [Aruba-]NAS-Filter-Rule RADIUS attribute.

If a policy is configured without any action, the **show** command will represent such an entry with the **permit** action .

Parameter	Description
<POLICY-NAME>	Specifies the policy name.

Examples

Showing information for all policies:

```
switch(config)# show port-access policy

Access Policy Details:
======================

Policy Name    : POL1
Policy Type    : Local
Policy Status : Applied
Base Policy:  N/A
ACL Name:  N/A

SEQUENCE    CLASS                       TYPE ACTION
----------- --------------------------- ---- ----------------------------------
20          dhcp                        ipv4 permit
30          test                        ipv4 cir kbps 1024 exceed drop

Policy Name   : POL1_copy
Policy Type   : Local
Policy Status : Applied
Base Policy: N/A
ACL Name:  N/A

SEQUENCE    CLASS                       TYPE ACTION
----------- --------------------------- ---- ----------------------------------
20          dhcp                        ipv4 permit
30          test                        ipv4 cir kbps 1024 exceed drop
```

Showing information for a particular policy:

```
switch(config)# show port-access policy RADIUS_115315236
Access Policy Details:
----------------------

Policy Name   : RADIUS_115315236
Policy Type   : Radius
Policy Status : Applied
Base Policy   : N/A
ACL Names     : DHCP, WebServices-Student

SEQUENCE    CLASS                        TYPE ACTION
----------- ---------------------------- ---- ----------
10          RADIUS_3241199543_2521983626 ipv4 permit


switch(config)# show port-access policy RADIUS_407949976
Access Policy Details:
----------------------

Policy Name   : RADIUS_407949976
Policy Type   : Radius
Policy Status : Applied
Base Policy   : test_policy_test_cppm_role-3006-1
ACL Names     : N/A


SEQUENCE    CLASS                        TYPE ACTION
----------- ---------------------------- ---- ---------
10          RADIUS_407949976_4016176641  ipv4 permit
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command output modified to display **Base Policy** and **ACL Names**.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access policy hitcounts

`show port-access policy <POLICY-NAME> hitcounts {port | client}`

Description

Shows port access hit count statistics.

Parameter	Description
<POLICY-NAME>	Specifies the policy name.
`port`	Selects port mode.
`client`	Selects client mode.

Examples

Showing policy hit counts (statistics) with current rate:

```
switch# show port-access policy POL6 hitcounts port

Port Access Policy Hit-Counts Details:
======================================

Policy Name   : POL1
Policy Type   : Local
Policy Status : Applied

SEQUENCE CLASS       TYPE ACTION                                 CUR-RATE(kbps)
-------- ----------- ---- -------------------------------------- --------------
30       test8       ipv4 cir kbps 1024 exceed cbs 2048 drop         512

Class Name : dhcp
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                             HIT-COUNT
----------- ------------------------------------------------------- -----------
10          match icmp any any count                                982150

Class Name : clearpass-web
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                                 HIT-COUNT
----------- ----------------------------------------------------------- -----------
70          match udp any any count                                     15101830
Class Name : web-traffic
Class Type : ipv4

SEQUENCE    CLASS-ENTRY                                                 HIT-COUNT
----------- ----------------------------------------------------------- -----------
4           match any any any count                                     3194
5           match any 10.1.1.1 10.1.1.2 dscp AF11 count                 1716

Class Name : class6
Class Type : ipv6

SEQUENCE    CLASS-ENTRY                                                 HIT-COUNT
----------- ----------------------------------------------------------- -----------
10          match any any any count                                     0
20          match icmpv6 2001:db8:a::123 2001:db8:a::125 dscp AF11
             count                                                      0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 120
Port access role commands

app-recognition enable

`[no] app-recognition enable`

Description

Enable the application recognition role on a port. The **app-recognition** is disabled by default.

The **no** form of this command disables the application recognition role.

Examples

Configuring application recognition port for a role:

```
switch(config)# port-access role role01
switch(config-pa-role)# app-recognition enable
```

Disable application recognition for a role:

```
switch(config)# port-access role role01
switch(config-pa-role)# no app-recognition enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

For more information on application recognition feature, refer to the *Application Visibility and Control Guide* for your switch model.

Command History

Release	Modification
10.11	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into	Administrators or local user group members with execution rights for this command.

Platforms	Command context	Authority
	the `config-pa-role` context.	

associate captive-portal-profile

```
associate captive-portal-profile <PROFILE-NAME>
no associate captive-portal-profile <PROFILE-NAME>
```

Description

Associates the captive portal profile with the current role.

The **no** form of this command dissociates the captive portal profile with the role.

Parameter	Description
<PROFILE-NAME>	Specifies the captive portal profile name to associate with the current role. The profile must be present in the switch before associating it with a role. Length: 1 to 64 characters.

Examples

Associating a captive portal profile with a role:

```
switch(config)# port-access role role01
switch(config-pa-role)# associate captive-portal-profile prof01
```

Dissociating a captive portal profile from the role:

```
switch(config-pa-role)# no associate captive-portal-profile
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

associate macsec-policy

```
associate macsec-policy <POLICY-NAME>
no associate macsec-policy [<POLICY-NAME>]
```

Description

Associates a MACsec policy with a role. When a role that has a MACsec policy associated is applied to a port, all data traffic is blocked on the port until a secure channel is successfully established.

If a MACsec policy is associated with a role that is applied on a non-MACsec capable interface, the client will be in an unauthorized state and the port will remain in a blocked state.

The **no** form of this command disassociates the policy from the role.

Parameter	Description
<POLICY-NAME>	Specifies the MACsec policy name. Range: Up to 128 characters.

Examples

Associating a MACsec policy with a role.:

```
switch(config)# port-access role role01
switch(config-pa-role)# associate macsec-policy Client-Connect
```

Disassociating a MACsec policy from a role:

```
switch(config-pa-role)# no associate macsec-policy
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.10	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

associate policy

```
associate policy <POLICY-NAME>
```

`no associate policy <POLICY-NAME>`

Description

Associates the policy with the current role.

The **no** form of this command dissociates the policy from the role.

Parameter	Description
<POLICY-NAME>	Specifies the policy name to associate with the current role. Range: Up to 64 characters. **NOTE:** Only those policies created by using the **port-access policy** command are allowed to be associated with a role. Policies created using the **policy** command are not allowed to be associated with a role. Policies that are of the downloaded type are not allowed to be associated with a role.

Examples

Associating a policy with a role:

```
switch(config)# port-access role role01
switch(config-pa-role)# associate policy policy01
```

Dissociating a policy from the role:

```
switch(config-pa-role)# no associate policy poilcy01
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

auth-mode

`auth-mode {client-mode | device-mode | multi-domain}`

Description

Configures the authentication mode for the clients that are associated with the current role.

Parameter	Description
`client-mode`	Selects client mode. In this mode, all clients connecting to the port are sent for authentication.
`device-mode`	Selects device mode. In this mode, only the first client connecting to the port is sent for authentication. Once this client is authenticated, the port is considered as open and all subsequent clients trying to connect on that port are not sent for authentication.
`multi-domain`	Selects multidomain mode. In this mode only one voice device is allowed to be authenticated in addition to the configured data devices on a port. By default only one data device is allowed to be authenticated on the multidomain mode along with one voice device. You can configure the maximum number of data devices allowed with the **aaa authentication port-access client-limit multi-domain** command. If a second voice device or a data device greater than the configured data client limit onboards, a violation is triggered. You must configure a voice VLAN for IP phones to onboard a voice device in the multidomain authentication mode. To authorize a voice device, you must perform one of the following: ■ Configure the AAA server to send the **Aruba-Device-Traffic-Class** Aruba VSA with value **1**. ■ Configure the **device-traffic-class** parameter in the role to be applied to indicate a voice device. Without this VSA value or the device type in the role, the switch considers the voice device as a data device.

Examples

Configuring the client authentication mode:

```
switch(config-pa-role)# auth-mode client-mode
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Added **multi-domain** parameter
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

cached-reauth-period

```
cached-reauth-period [<PERIOD>]
no cached-reauth-period
```

Description

Enables cached reauthentication, setting the period after which clients that associated with the current role must be reauthenticated.

The **no** form of this command disables cached authentication.

Parameter	Description
<PERIOD>	Specifies the cached reauthentication period (in seconds) for clients associated with the role. Default: 30. Range: 30 to 4294967295.

Examples

Enabling cached reauthentication and setting its period to 200 seconds:

```
switch(config-pa-role)# cached-reauth-period 200
```

Disabling cached reauthentication:

```
switch(config-pa-role)# no cached-reauth-period
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role`	Administrators or local user group members with execution rights for this command.

Platforms	Command context	Authority
	command takes you into the `config-pa-role` context.	

client-inactivity timeout

```
client-inactivity timeout {<CLIENT-INACTIVITY-PERIOD> | none}
no client-inactivity timeout
```

Description

Configures the period that the switch waits for a response from a client after which it removes the client from the role.

The **no** form of the command resets the timeout period to the default.

Parameter	Description
<CLIENT-INACTIVITY-PERIOD>	Specifies the client inactivity time (in seconds). Default: Dynamic client age-out. Range: 60 to 4294967295
`none`	Selects no client deletion due to inactivity.

Examples

Configuring client inactivity timer for a role:

```
switch(config-pa-role)# client-inactivity timeout 3600
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.14	The range of the command has been modified from 60 to 4294967295 seconds.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

description

`description <ROLE-DESCRIPTION>`

Description

Configures the role description.

Parameter	Description
<ROLE-DESCRIPTION>	Specifies the role description. Range: Up to 255 characters.

Examples

Configuring the role description:

```
switch(config-pa-role)# description student role
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

device-traffic-class

```
device-traffic-class voice
no device-traffic-class [voice]
```

Description

Configures the voice class of client to associate with the role.

This attribute is applicable only to **critical-voice-role** role. It is not applicable to other special roles such as, **preauth-role**, **reject-role**, and **fallback-role**.

The **no** form of the command resets the class of client to the default, data.

Usage

Traffic class of a client will not be considered as voice unless **device-traffic-class** is set to **voice** the role. In the multidomain mode, clients with a role that do not have the value of the **device-traffic-class** attribute set to voice will be considered as data device.

Examples

Configuring voice device traffic class for role **role01**:

```
switch(config)# port-access role role01
switch(config-pa-role)# device-traffic-class voice
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The **port-access role** command takes you into the **config-pa-role** context.	Administrators or local user group members with execution rights for this command.

gateway-zone zone gateway-role

```
gateway-zone zone <ZONE-NAME> gateway-role <GATEWAY-ROLE-NAME>
```

Description

Configures the per-role gateway zone details needed for user-based tunneling (UBT). For information on UBT, see the *Fundamentals Guide*.

Parameter	Description
<ZONE-NAME>	Specifies the role gateway zone name.
<GATEWAY-ROLE-NAME>	Specifies an existing gateway role name.

Examples

Configuring role gateway zone details:

```
switch(config-pa-role)# gateway-zone zone zone1 gateway-role role1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

mtu

`mtu <MTU-SIZE>`

Description

Configures the MTU (maximum transmission unit) size of a client for a role.

Parameter	Description
<MTU-SIZE>	Specifies the MTU size in bytes. Range: 68 to 9198.

Examples

Configuring client MTU size:

```
switch(config-pa-role)# mtu 9198
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

poe-allocate-by

```
poe-allocate-by {class | usage}
no poe-allocate-by {class | usage}
```

Description

Configures the PoE allocation method for the configured port-access role. If the allocation method is not configured, the power allocation method configured on the interface is used.

The **no** form of this command removes the configuration.

Parameter	Description
`class`	Configures the PoE class-based allocation method.
`usage`	Configures the PoE usage-based allocation method.

Examples

Configuring **class** as PoE allocation method for the role **role01**:

```
switch(config)# port-access role role01
switch(config-pa-role)# poe-allocate-by class
```

Removing PoE allocation method configured for the port-access role:

```
switch(config)# port-access role role01
switch(config-pa-role)# no poe-allocate-by
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

poe-priority

```
poe-priority {critical | high | low}
no poe-priority
```

Description

Configures the power distribution priority for the port access roles. High power consumption can be prevented using the **poe-priority** control mechanism.

The **no** form of this command restores the power distribution to its default priority.

Parameter	Description
`critical`	Selects critical priority.
`high`	Selects high priority.
`low`	Selects low priority.

Examples

Configuring PoE priority for a new role:

```
switch(config)# port-access role role01
switch(config-pa-role)# poe-priority critical
```

Resetting PoE priority for the role to its default:

```
switch(config)# port-access role role01
switch(config-pa-role)# no poe-priority
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

port-access role

```
port-access role <ROLE-NAME>
no port-access role <ROLE-NAME>
```

Description

Creates a new port access role or modifies an existing role. This command takes you into the **config-pa-role** context. A maximum of 32 port access roles can be created.

The **no** form of this command deletes a role.

Parameter	Description
<ROLE-NAME>	Specifies the role name. Range: Up to 64 characters.

Examples

Creating a new role:

```
switch(config)# port-access role basic01
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

reauth-period

```
reauth-period <PERIOD>
no reauth-period
```

Description

Configures the period after which clients that associated with the current role must be reauthenticated.

The reauthentication period configured here takes precedence over the reauthentication period configured at the port level.

Parameter	Description
<PERIOD>	Specifies the reauthentication period (in seconds) for clients associated with the role. Default: None. Range: 1 to 4294967295. A reauthentication period of less than 60 seconds is not recommended.

Examples

Configuring reauthentication period:

```
switch(config-pa-role)# reauth-period 3000
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

session timeout

```
session-timeout <SESSION-TIMEOUT>
no session-timeout
```

Description

Configures the session timeout for the role. After the timeout period, the session is disconnected.

Parameter	Description
<SESSION-TIMEOUT>	Specifies the session timeout (in seconds). Range: 1 to 4294967295. A timeout of less than 60 seconds is not recommended.

Examples

Configuring session timeout for a role:

```
switch(config-pa-role)# session timeout 3600
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

show aaa authentication port-access interface client-status

```
show aaa authentication port-access interface {all | <IF-NAME>}
client-status [mac <MAC-ADDRESS>]
```

Description

Shows information about the status of the role applied on ports.

Parameter	Description
`all`	Specifies all interfaces.
<IF-NAME>	Specifies the interface name.
<MAC-ADDRESS>	Specifies the client MAC address.

Examples

Showing information about a client:

```
switch# show aaa authentication port-access interface all client-status mac
00:00:00:00:00:01

Port Access Client Status Details

Client 00:00:00:00:00:01
============================
Session Details
---------------
  Port         : 1/7/24
  Session Time : 151s

Authentication Details
----------------------
  Status          : mac-auth Authenticated
  Auth Precedence : mac-auth - Authenticated, dot1x - Not attempted

Authorization Details
----------------------
  Role   : UserRole_1
  Status : Applied
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access role

```
show port-access role {local | clearpass | radius | name <ROLE-NAME>}
```

Description

Shows information about roles configured locally, or downloaded from ClearPass Policy Manager and the RADIUS server.

Displays information only about the attributes defined for the role. The base policy name will be suffixed with * for RADIUS overridden roles.

Parameter	Description
`local`	Shows information about locally configured roles.
`clearpass`	Shows information about roles downloaded from ClearPass Policy Manager.
`radius`	Shows information about roles downloaded from the RADIUS server.
<ROLE-NAME>	Specifies the role name.

Examples

Showing locally configured role information:

```
switch# show port-access role local
Role Information:
Name  : local_role_01
Type  : local
----------------------------------------------
Reauthentication Period             : 333 secs
Cached Reauthentication Period      : 300 secs
Access VLAN Name                    : Hpe
VLAN Group Name                     : group1
PoE Priority                        : low
Policy                              : deny-http-policy
Private-VLAN Port-Type              : secondar
```

Showing information for roles downloaded from ClearPass Policy Manager:

```
switch# show port-access role clearpass

Role Information:

Name  : CP_GIRI_DUR_GUEST_ROLE-3058-7
Type  : clearpass
Status: Completed
----------------------------------------------
    Reauthentication Period             : 300 secs
    Authentication Mode                 :
    Session Timeout                     : 1000000 secs
    Client Inactivity Timeout           :
    Description                         : Guest role for CP6
    Gateway Zone                        :
    UBT Gateway Role                    :
    Access VLAN                         : 20
    Native VLAN                         :
    Allowed Trunk VLANs                 :
    Access VLAN Name                    : vlan20
    Native VLAN Name                    :
    Allowed Trunk VLAN Names            :
    MTU                                 :
    QOS Trust Mode                      :
    STP Administrative Edge Port        : true
    PoE Priority                        :
    Captive Portal Profile              : CP6_CP_GIRI_DUR_GUEST_ROLE-3058-7
    Policy                              : CP6_CP_GIRI_DUR_GUEST_ROLE-3058-7
```

Showing locally configured role information:

```
switch# show port-access role local

Role Information:

   Name  : local_role_01
   Type  : local
   ----------------------------------------------
     Reauthentication Period             : 333 secs
     Cached Reauthentication Period      : 300 secs
     Access VLAN Name                    : Hpe
     VLAN Group Name                      : group1
     PoE Priority                         : low
     Policy                               : deny-http-policy
     Private-VLAN Port-Type               : secondary
```

Showing information for roles downloaded from a RADIUS server:

```
switch# show port-access role radius
Role Information:
Attributes overridden by RADIUS are prefixed by '*'.

Name : RADIUS_21963402
Type : radius
----------------------------------------------
Reauthentication Period: 333 secs
Access VLAN: 10
VLAN Group Name: group1
STP Administrative Edge Port : true
PoE Priority : low
PoE Allocation Method: class
Captive Portal Profile : testcpprof_29451201
Policy : PERMIT-ALL_87364653
Private-VLAN Port-Type : secondary
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.12	The following changes were introduced: ■ Command output updated to display information only about the attributes defined for the role. ■ Updated output to display **PoE Allocation method**. ■ The base policy name will be suffixed with * for RADIUS overridden roles.
10.08	Updated RADIUS role example with radius-overridden attributes
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

stp-admin-edge-port

```
stp-admin-edge-port
no stp-admin-edge-port
```

Description

Configures the port as a spanning tree administrative edge port for the role. This configuration removes the port participation from STP interactions when onboarding devices. This in turn helps in faster onboarding of devices.

The **no** form of the command disables STP edge port functionality.

If the port receives STP BPDU on the STP administrative edge configured port, the port will move to the STP state. You must configure the port as an STP administrative edge port only if you are sure that the connected device will not participate in STP interactions.

Example

Configuring STP edge port for a role:

```
switch(config)# port-access role role01
switch(config-pa-role)# stp-admin-edge-port
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

trust-mode

```
trust-mode [dscp | cos | none]
no trust-mode
```

Description

Configures QoS trust mode for the role.

The **no** form of this command configures the default trust mode for the role.

Parameter	Description
`dscp`	Selects trust DSCP and retain 802.1p priority.
`cos`	Selects trust 802.1p and retain DSCP or IP-ToS.
`none`	Selects no trusting of priority fields.

Examples

Configuring DSCP trust mode for a role:

```
switch(config)# port-access role role01
switch(config-pa-role)# trust-mode dscp
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

vlan

```
vlan {access | trunk native | trunk allowed} <VLAN-ID>
no vlan {access | trunk native | trunk allowed} <VLAN-ID>

vlan {access name | trunk native name | trunk allowed name} <VLAN-NAME>
no vlan {access name | trunk native name | trunk allowed name} [<VLAN-NAME>]
```

Description

Configures VLAN IDs or VLAN names, and VLAN modes for a port access role. You can configure either VLAN IDs or VLAN names, or a combination of both for a role.

The **no** form of the command deletes the VLAN configuration from the role. For trunk allowed VLAN names, you can delete the VLAN names individually or all names at once.

Parameter	Description
`access <VLAN-ID>`	Specifies the VLAN ID for the access VLAN. Supports a single VLAN ID in the range 1 to 4094.
`trunk native <VLAN-ID>`	Specifies the native VLAN ID on the trunk interface. Supports a single VLAN ID. Range: 1 to 4094.
`trunk allowed <VLAN-ID>`	Specifies the list of tagged or allowed VLANs on the trunk interface. Supports a list of VLAN IDs. Range: 1 to 4094.
`access name <VLAN-NAME>`	Specifies the VLAN name for the access VLAN. Supports a single VLAN name. Range: Up to 32 characters.
`trunk native name <VLAN-NAME>`	Specifies the native VLAN name on the trunk interface. Supports a single VLAN name. Range: Up to 32 characters
`trunk allowed name <VLAN-NAME>`	Specifies the tagged or allowed VLAN name on the trunk interface. Supports a single VLAN name. Range: Up to 32 characters. The switch supports a maximum of 50 trunk allowed VLAN names.

Usage

Note the following points when configuring the VLAN IDs and names for a role:

- For VLAN access and VLAN trunk native respectively, it is recommended to configure only one of either VLAN ID or name for a role. In case both VLAN ID and name are configured, then VLAN ID takes precedence and is applied with the role.
- For VLAN trunk allowed, you can collectively configure a maximum of 50 names and 1024 VLAN IDs. In case this limit is exceeded in the role, then that role is rejected when applying it to an onboarding device.

Platform	Maximum VLAN IDs per role	Maximum VLAN Namesper role	Total VLANs (ID + Name) per role
6300	1024	50	1024
6400	1024	50	1024

Examples

Configuring VLAN modes and VLAN IDs for a new role:

```
switch(config)# port-access role role01
switch(config-pa-role)# vlan trunk native 10
switch(config-pa-role)# vlan trunk allowed 11-15
switch(config-pa-role)# vlan access 50
```

Configuring VLAN modes and VLAN names for a new role:

```
switch(config)# port-access role role10
switch(config-pa-role)# vlan trunk native name hpe01
switch(config-pa-role)# vlan trunk allowed name data
switch(config-pa-role)# vlan trunk allowed name voice
switch(config-pa-role)# vlan trunk allowed name video
```

Deleting VLAN configuration from a role:

```
switch(config-pa-role)# no vlan trunk native 10
switch(config-pa-role)# no vlan trunk allowed 10-15
switch(config-pa-role)# no vlan access 50
```

Deleting trunk allowed VLAN names from a role individually:

```
switch(config-pa-role)# no vlan trunk native name hpe01
switch(config-pa-role)# no vlan trunk allowed name data
switch(config-pa-role)# no vlan trunk allowed name voice
switch(config-pa-role)# no vlan trunk allowed name video
```

Deleting trunk allowed VLAN names from a role all at once:

```
switch(config-pa-role)# no vlan trunk native name hpe01
switch(config-pa-role)# no vlan trunk allowed name
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-role` The `port-access role` command takes you into the `config-pa-role` context.	Administrators or local user group members with execution rights for this command.

Chapter 121

Port access security violation commands

port-access security violation action

```
port-access security violation action {notify | shutdown}
no port-access security violation action
```

Description

Configures the action that the switch must take whenever a security violation occurs at a port, such as the number of clients exceeding the configured client limit. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

The **no** form of the command resets the action to the default action, notify.

Parameter	Description
`notify`	Specifies that the switch notifies any security violation as an event or log in the syslog server, and also sends an SNMP trap notification. This action is the default. The format of the event log that is generated for notifying the security violation is: `Client limit exceeded on port` **`<PORT>`**`, caused by an unauthenticated client` **`<MAC-ADDRESS>`**.
`shutdown`	Specifies that the switch shuts down the port where the client limit has exceeded. A port that is shut down can be configured to auto-recover after a recovery period that can be configured with the **port-access security violation action shutdown auto-recovery** and **port-access security violation action shutdown recovery-timer** commands.

Examples

Configuring the shutdown security violation action for interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access security violation action shutdown
```

Resetting the security violation action to the default value:

```
switch(config-if)# no port-access security violation action
```

Configuring the shutdown security violation action for a LAG port:

```
switch(config)# interface lag 1
switch(config-lag-if)# port-access security violation action shutdown
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

port-access security violation action shutdown auto-recovery

```
port-access security violation action shutdown auto-recovery {enable | disable}
no port-access security violation action shutdown auto-recovery {enable | disable}
```

Description

Configures auto-recovery of the port when the security violation action is configured as shutdown.

This configuration allows the port, that is shut down when a security violation occurs, to be automatically enabled after the recovery timer expires.

The **no** form of the command resets auto-recovery to the default, disable.

Parameter	Description
`enable`	Enables auto-recovery of port when the security violation action is configured as shutdown.
`disable`	Disables auto-recovery of port when the security violation action is configured as shutdown.

Examples

Enabling auto-recovery of port:

```
switch(config-if)# port-access security violation action shutdown auto-recovery
enable
```

Disabling auto-recovery of port:

```
switch(config-if)# no port-access security violation action shutdown auto-recovery
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

port-access security violation action shutdown recovery-timer

```
port-access security violation action shutdown recovery-timer <RECOVERY-TIME>
no port-access security violation action shutdown recovery-timer
```

Description

Configures security violation recovery timer for the port when the security violation action is configured as shutdown.

The **no** form of the command resets the shutdown recovery timer to the default, 10.

Parameter	Description
<RECOVERY-TIME>	Specifies the recovery timer (in seconds) after which the port, which is shut down because of security violation, is automatically enabled. Default: 10. Range: 10 to 600.

Examples

Configuring the shutdown recovery-timer on a port:

```
switch(config-if)# port-access security violation action shutdown recovery-timer
60
```

Resetting the shutdown recovery-timer to the default value:

```
switch(config-if)# no port-access security violation action shutdown recovery-
timer
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if`	Administrators or local user group members with execution rights for this command.

show interface

`show interface <INTERFACE-NAME>`

Description

Displays active configurations and operational status information for interfaces including the reason for the port shutdown because of a security violation at the port.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface name.

Examples

The following example shows the status of the interface when it is shutdown because of security violation:

```
switch# show interface 3/1/35

Interface 3/1/25 is down
 Admin state is up
 State information: Disabled by port-access
 Link state: down for 53 minutes (since Tue Jun 01 01:27:28 UTC 2021)
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access aaa violation interface

`show port-access aaa violation interface {all|<INTERFACE>}`

Description

Shows information about violations that have occurred and the count of violations for port access authentication methods at the interfaces.

Parameter	Description
`all`	Specifies all interfaces.
`<INTERFACE>`	Specifies the interface name or a comma-separated list of interfaces, or a hyphen-separated interface range.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for violations for all interfaces:

```
switch# show port-access aaa violation interface all

Client limit exceeded violation status

----------------------------------------------------
   Port      Violation      Violation-Count
----------------------------------------------------
   1/1/1       No                 0
   1/1/2       Yes                10
   1/1/5       No                 10
```

Showing information for violations on interfaces 1/1/1 to 1/1/2:

```
switch# show port-access aaa violation interface 1/1/1-1/1/2

Client limit exceeded violation status

----------------------------------------------------
   Port      Violation      Violation-Count
----------------------------------------------------
   1/1/1       No                 0
   1/1/2       Yes                10
```

Showing information when no violation action is configured:

```
switch# show port-access aaa violation interface 1/1/1

Port-access aaa violation is not configured
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access port-security violation client-limit-exceeded interface

```
show port-access port-security violation client-limit-exceeded interface
{all|<INTERFACE>}
```

Description

Shows information on the number of client-limit-exceeded security violations that have occurred. The output can be filtered by interface.

Parameter	Description
`all`	Specifies all interfaces.
`<INTERFACE>`	Specifies the interface name or a comma-separated list of interfaces, or a hyphen-separated interface range.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for all ports:

```
switch# show port-access port-security violation client-limit-exceeded interface
all

Client limit exceeded violation status

-----------------------------------------------------
   Port      Violation      Violation-Count
-----------------------------------------------------
   1/1/1       No                   0
   1/1/2       Yes                  10
   1/1/5       No                   10
```

Showing information for a port range:

```
switch# show port-access port-security violation client-limit-exceeded interface
1/1/1-1/1/2

Client limit exceeded violation status
```

```
----------------------------------------------------
   Port      Violation      Violation-Count
----------------------------------------------------
   1/1/1       No                 0
   1/1/2       Yes                10
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.08	Syntax modified from **show port-access security violation client-limit-exceeded interface {all|<INTERFACE-NAME>}** to **show port-access port-security violation client-limit-exceeded interface {all|<INTERFACE-NAME>}**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

Chapter 122

Port access VLAN group commands

associate-vlan

```
associate-vlan <VLAN-ID>
no associate-vlan <VLAN-ID>
```

Description

Associates VLANs with an existing VLAN group.

The **no** form of this command removes the association of the VLAN with the specified VLAN group.

Parameter	Description
<VLAN-ID>	Specifies the VLAN or a specific set of VLANs. Range 1 to 4094.

Examples

Associating VLANs with **group1**:

```
switch(config)# port-access vlan-group group1
switch(config-pa-vlan-group)# associate-vlan 5,10-15,20,21
```

Associating additional VLANs with **group1**:

```
switch(config)# port-access vlan-group group1
switch(config-pa-vlan-group)# associate-vlan 30-40
```

Dissociating VLANs 10-15 from VLAN **group1**:

```
switch(config-pa-vlan-group)# no associate-vlan 10-15
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-pa-vlan-group`	Administrators or local user group members with execution rights for this command.

port-access vlan-group

```
port-access vlan-group <NAME>
no port-access vlan-group <NAME>
```

Description

Creates the specified VLAN group (if it does not already exist) and then enters its context **config-pa-vlan-group**. For an existing VLAN group, this command enters the context of the specified VLAN group.

The **no** form of this command removes the specified VLAN group.

In order for the group to be applied to a client, VLANs associated to the group should be configured on the switch. If not, the role displays an error.

Parameter	Description
<NAME>	Specifies the name of the VLAN group. Range 2 to 32 characters.

Examples

Creating VLAN **group1** and associating VLANs with it:

```
switch(config)# port-access vlan-group group1
switch(config-pa-vlan-group)# associate-vlan 5,10-15,20,21
```

Dissociating VLANs 10-15 from VLAN **group1**:

```
switch(config-pa-vlan-group)# no associate-vlan 10-15
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config`	Administrators or local user group members with execution rights for this command.

show running-config port-access vlan-group

```
show running-config port-access vlan-group
```

Description

Shows information for all configured VLAN groups.

Example

Showing the port access VLAN group configuration:

```
switch# show running-config port-access vlan-group
...
port-access vlan-group group1
    associate-vlan 5,20,21,30-40
port-access vlan-group group2
    associate-vlan 50-60,75-85
...
```

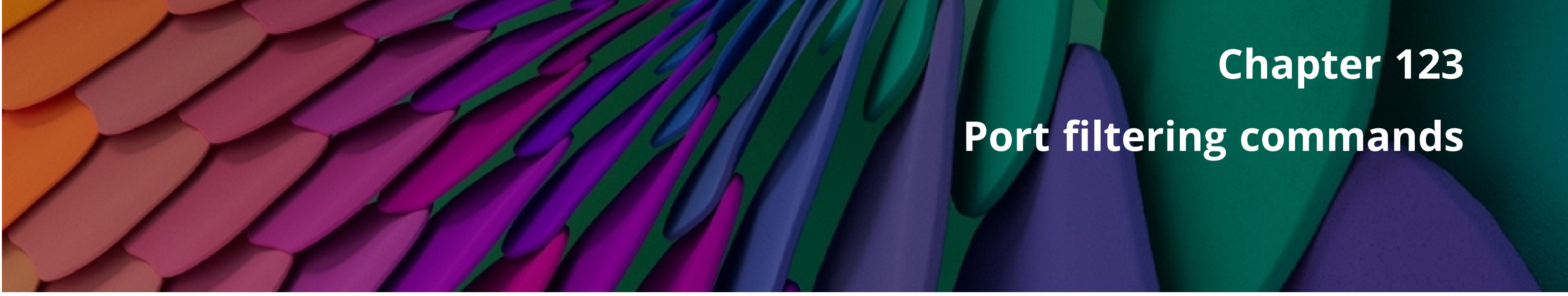
For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 123

Port filtering commands

portfilter

```
portfilter <INTERFACE-LIST>
no portfilter [<INTERFACE-LIST>]
```

Description

Configures the specified ports so they do not egress any packets that were received on the source port specified in interface context.

The **no** form of this command removes the port filter setting from one or more ingress ports/LAGs.

This configuration will disable flow tracking statistics collection.

Parameter	Description
<INTERFACE-LIST>	Specifies a list of ports/LAGs to be blocked for egressing. Specify a single interface or LAG, or a range as a comma-separated list, or both. For example: `1/1/1`, `1/1/3-1/1/6`,`lag2`, `lag1-lag4`. *On the 6400 Switch Series, interface identification differs.*

Usage

When a port filter configuration is applied on the same ingress physical port/LAG, the configuration is updated with the new sets of egress ports/LAGs that are to be blocked for egressing and that are not a part of its previous configuration. Duplicate updates on an existing port filter configuration are ignored.

When egress ports/LAGs are removed from the existing port filter configuration of an ingress port/LAG, egressing is allowed again on those egress ports/LAGs for all packets originating from the ingress port/LAG.

The **no portfilter [<*IF-NAME-LIST*>]** command removes port filter configurations from the egress ports/LAGs listed in the <*IF-NAME-LIST*> parameter only. All other egress ports/LAGs in the port filter configuration of the ingress port/LAG remain intact.

If no physical ports or LAGs are provided for the **no portfilter** command, the command removes the entire port filter configuration for the ingress port/LAG.

Examples

On the 6400 Switch Series, interface identification differs.

Creating a filter that prevents packets received on port **1/1/1** from forwarding to ports **1/1/3-1/1/6** and to LAGs **1** through **4**:

```
switch(config)# interface 1/1/1
switch(config-if)# portfilter 1/1/3-1/1/6,lag1-lag4
```

Creating a filter that prevents packets received on LAG **1** from forwarding to ports **1/1/6** and LAGs **2** and **4**:

```
switch(config)# interface lag 1
switch(config-lag-if)# portfilter 1/1/6,lag2,lag4
```

Removing filters from an existing configuration that allows back packets received on port **1/1/1** to forward to ports **1/1/6** and LAGs **3** and **4**:

```
switch(config)# interface 1/1/1
switch(config-if)# no portfilter 1/1/6,lag3,lag4
```

Removing all filters from an existing configuration that allows back packets received on LAG **1** to forward to all the ports and LAGs:

```
switch(config)# interface lag 1
switch(config-lag-if)# no portfilter
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.14	Added information related to role based IPFIX.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config-if` `config-lag-if`	Administrators or local user group members with execution rights for this command.

show portfilter

`show portfilter [<IFNAME>][vsx-peer]`

Description

Displays filter settings for all interfaces or a specific interface.

Parameter	Description
<IFNAME>	Specifies the ingress interface name. Specifies one of these values: ■ *<FQDN>*: a fully qualified domain name. ■ *<IPV4>*: an IPv4 address. ■ *<IPV6>*: an IPv6 address.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

On the 6400 Switch Series, interface identification differs.

Displaying all port filter settings on the switch:

```
switch# show portfilter
Incoming   Blocked
Interface  Outgoing Interfaces
--------------------------------------------------------------------------------
1/1/1      1/1/3-1/1/6,lag1-lag2
1/1/3      1/1/1,1/1/5,1/1/7,1/1/9,1/1/11,1/1/13,1/1/15,1/1/17,1/1/19,1/1/21,
           1/1/23,1/1/25,1/1/27,1/1/29,1/1/31,1/1/33,1/1/35
lag2       1/1/1,1/1/3-1/1/6
```

Displaying the port filter settings for port **1/1/1**:

```
switch# show portfilter 1/1/1
Incoming   Blocked
Interface  Outgoing Interfaces
--------------------------------------------------------------------------------
1/1/1      1/1/3-1/1/6,lag1-lag2
```

Displaying the port filter settings for **LAG2**:

```
switch# show portfilter lag2
Incoming   Blocked
Interface  Outgoing Interfaces
--------------------------------------------------------------------------------
lag2       1/1/1,1/1/3-1/1/6
```

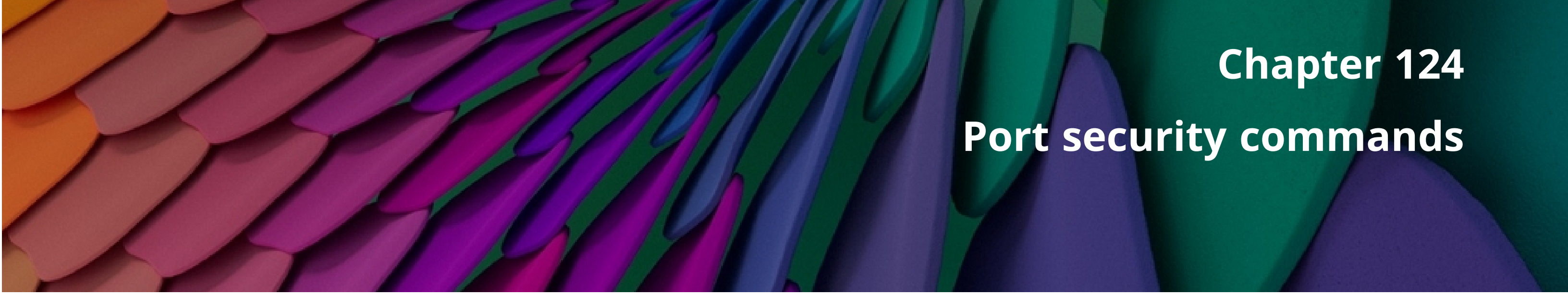
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.



Chapter 124

Port security commands

port-access port-security

```
port-access port-security {enable | disable}
no port-access port-security {enable | disable}
```

Description

Enables or disables port security globally or at the port level.

Examples

Enabling port security globally:

```
switch(config)# port-access port-security enable
```

Disabling port security globally:

```
switch(config)# port-access port-security disable
```

Enabling port security on a port:

```
switch(config-if)# port-access port-security enable
```

Disabling port security on a port:

```
switch(config-if)# port-access port-security disable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config` `config-if`	Administrators or local user group members with execution rights for this command.

port-access port-security client-limit

```
port-access port-security client-limit <CLIENTS>
no port-access port-security client-limit
```

Description

Configures the maximum number of clients that are allowed on a port. After configuring the maximum clients limit, the MAC addresses of the clients can be learned by one of the following methods:

- User can manually configure all MAC addresses by using the **mac-address** command.
- User can allow the port to dynamically learn all MAC addresses.
- User can configure a fixed number of MAC addresses and allow the switch to learn the remaining addresses dynamically.

The **no** form of the command resets the number of clients to the default, 1.

Parameter	Description
<CLIENTS>	Specifies the maximum number of clients. Default: 1. Range: **0 to 32 (4100i, 6000, 6100). 0 to 64 (8325, 10000). 0 to 32 (6200). 0 to 64 (6300, 6400).** **NOTE:** If client limit is configured to 0, the port will not learn any MAC address from inbound traffic and will be blocked indefinitely. An administrator can use this along with the port-access security violation configuration to get notified of a client attempting to connect to a port.

Examples

Configuring client limit on a port:

```
switch(config-if)# port-access port-security enable
switch(config-if-port-security)# client-limit 24
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-port-security`	Administrators or local user group members with execution rights for this command.

port-access port-security mac-address

```
port-access port-security mac-address <MAC-ADDRESS>
no port-access port-security mac-address <MAC-ADDRESS>
```

Description

Configures a static client (current interface (port) context) MAC address.

The **no** form of this command removes an authorized static client from the port.

Parameter	Description
<MAC-ADDRESS>	Specifies the static client MAC address.

Examples

Configuring a static client on a port:

```
switch(config-if)# port-access port-security
switch(config-if-port-security)# mac-address aa:bb:cc:dd:ee:ff
```

Deleting a static client on a port:

```
switch(config-if)# port-access port-security
switch(config-if-port-security)# no mac-address aa:bb:cc:dd:ee:ff
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-port-security`	Administrators or local user group members with execution rights for this command.

show port-access port-security interface client-status

```
show port-access port-security interface {all|<IF-NAME>}
     client-status [mac <MAC-ADDRESS>]
```

Description

Shows port security clients status information for the ports. The output can be filtered by interface or MAC address.

Parameter	Description
`all`	Selects all interfaces.
<IF-NAME>	Specifies the interface name.
<MAC-ADDRESS>	Specifies the client MAC address.

Examples

On the 6400 Switch Series, interface identification differs.

Showing client status information for all ports:

```
switch# show port-access port-security interface all client-status

Port Security Client Status Details

  Authorized-Clients    Type           Port
  -------------------------------------------
  AB:CD:DE:FF:AA:BB     static         1/1/1
  DD:CD:AB:CD:EE:01     dynamic        1/1/2
  00:50:56:96:7e:fc     sticky-dynamic 1/3/2
```

Showing client status information with sticky-learning enabled for all ports:

```
switch# show port-access port-security interface all client-status

Port Security Client Status Details

  Authorized-Clients    Type              Port
  ---------------------------------------------
  AB:CD:DE:FF:AA:BB     sticky-static     1/1/1
  DD:CD:AB:CD:EE:01     sticky-dynamic    1/1/2
  DE:CD:AB:BB:EE:02     sticky-dynamic    1/1/2
```

Showing client status information for a client:

```
switch# show port-access port-security interface 1/3/2 client-status mac
00:50:56:96:7e:fc

Port Security Client Status Details

  Authorized-Clients       Type           Port
  --------------------------------------------------
  00:50:56:96:7e:fc        sticky-dynamic 1/3/2
```

Showing client status information for a port:

```
switch# show port-access port-security interface 1/3/2 client-status

Port Security Client Status Details

  Authorized-Clients       Type           Port
  --------------------------------------------------
  00:50:56:96:7e:fc        sticky-dynamic 1/3/2
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access port-security interface port-statistics

```
show port-access port-security interface {all|<IF-NAME>} port-statistics
```

Description

Shows port security statistics for the ports in a switch. The output can be filtered by interface.

Parameter	Description
`all`	Selects all interfaces.
`<IF-NAME>`	Specifies the interface name.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for all ports.

```
switch# show port-access port-security interface all port-statistics

Port 1/1/1
==========

  Client Details
  --------------
    Number of authorized clients            : 0
    Number of sticky authorized clients     : 2
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show port-access security violation sticky-mac-client-move interface

```
show port-access security violation sticky-mac-client-move interface {all|<IF-NAME>}
```

Description

Shows information about the sticky-mac client move violation. The output can be filtered by interface.

Parameter	Description
`all`	Selects all interfaces.
`<IF-NAME>`	Specifies the interface name.

Examples

On the 6400 Switch Series, interface identification differs.

Showing information for all ports.

```
switch# show port-access port-security violation sticky-mac-client-move
        interface all

Sticky MAC Client Move Violation Status Details

----------------------------------------------------
   Port      Violation      Violation-Count
----------------------------------------------------
   1/1/1       No                 0
   1/1/2       Yes                10
   1/1/5       No                 10
```

Showing information for a particular port.

```
switch# show port-access port-security violation sticky-mac-client-move
        interface 1/1/1

Sticky MAC Client Move Violation Status Details

----------------------------------------------------
   Port      Violation      Violation-Count
```

```
---------------------------------------------------
   1/1/1       No                 10
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

sticky-learn enable

```
sticky-learn enable
no sticky-learn enable
```

Description

Enables sticky learning on the port. All the existing and new MACs learned on the port are made sticky.

The **no** form of this command disables the sticky learning on the port.

Examples

Enabling sticky learning on the port:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access port-security
switch(config-if-port-security)# sticky-learn enable
```

Disabling sticky learning on the port:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access port-security
switch(config-if-port-security)# no sticky-learn enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-port-security`	Administrators or local user group members with execution rights for this command.

sticky-learn mac

```
sticky-learn mac <MAC-ADDRESS> [vlan <VLAN-ID>]
no sticky-learn mac <MAC-ADDRESS> [vlan <VLAN-ID>]
```

Description

Configures the MAC addresses of sticky static clients. After configuring, clients are directly added to the MAC address table.

The **no** form of this command removes an authorized sticky static client from the port.

Parameter	Description
<MAC-ADDRESS>	Specifies the static sticky client MAC address.
vlan *<VLAN-ID>*	Specifies the static sticky client VLAN ID.

Examples

Configuring a sticky static client on a port:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access port-security
switch(config-if-port-security)# sticky-learn mac-address aa:bb:cc:dd:ee:ff
```

Configuring a sticky static client with a VLAN ID on a port:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access port-security
switch(config-if-port-security)# sticky-learn mac-address aa:bb:cc:dd:ee:ff vlan 4
```

Removing a sticky static client from a port:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access port-security
switch(config-if-port-security)# no sticky-learn mac-address aa:bb:cc:dd:ee:ff
```

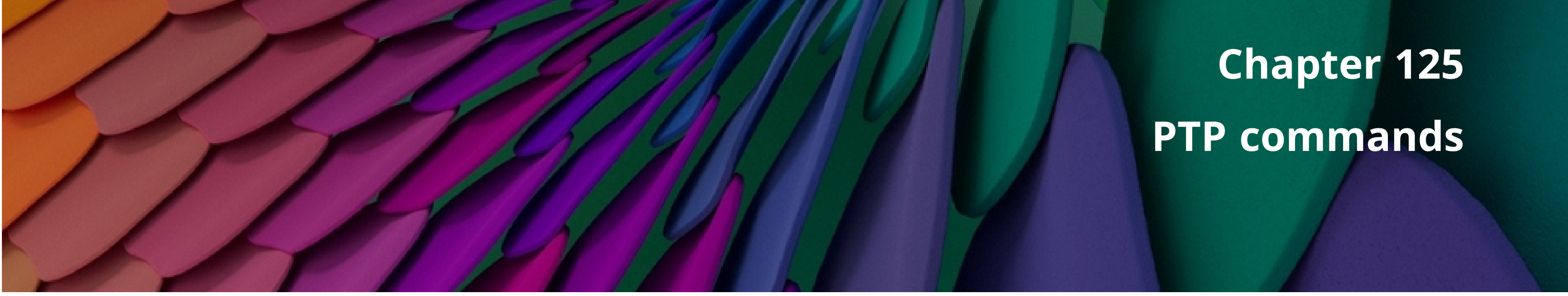
For more information on features that use this command, refer to the Security Guide for your switch model.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6300 6400	`config-if-port-security`	Administrators or local user group members with execution rights for this command.



Chapter 125

PTP commands

clear ptp statistics

`clear ptp statisctics [<IFNAME>]`

Description

Clears PTP counters for the given interface.

Parameter	Description
<IFNAME>	Optional: Specifies the interface name.

Examples

Clearing PTP counters for the given interface:

```
switch# clear ptp statistics 1/1/8
switch# clear ptp statistics lag1
switch# clear ptp statistics
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Added boundary clock support on the 6300 Switch Series.
10.10	Command introduced on the 6300 Switch Series for transparent clock.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Administrators or local user group members with execution rights for this command.

clock-domain

```
clock-domain <DOMAIN-NUMBER>
no clock-domain
```

Description

Configures the PTP clock domain to a specified value.

The **no** form of this command removes the PTP domain configuration of the PTP clock.

Parameter	Description
<DOMAIN-NUMBER>	Sets the PTP clock domain. Range: 0 to 254. Value configurable subject to limits established by the PTP profile.

Usage

- The one-step end-to-end transparent clock works across domains.
- For boundary clocks, the clock-domain has to be identical with the domain used in the network.
- All PTP devices must be within same domain to be able to sync with each other.
- This command is only enabled in the PTP profile context.
- For PTP transparent clock, you must configure the same clock-domain as on clients and GM to synchronize.

Examples

Entering the PTP profile context and setting the PTP clock domain value:

```
switch(config)# ptp profile aes-r16
switch(config-ptp)#
switch(config-ptp)#clock-domain 4
switch(config-ptp)#
```

Removing the PTP clock domain value:

```
switch(config-ptp)# no clock-domain
switch(config-ptp)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-ptp`	Administrators or local user group members with execution rights for this command.

clock-step

```
clock-step {one-step|two-step}
no clock-step
```

Description

Configures the clock step mode that determines when the egress-time information is sent.

The 6300 Switch Series (models R8S89A and R8S90A) support both one-step and two-step modes for boundary clocks. Transparent clocks only support one-step mode. All other 6300 Switch Series models support only transparent clock one-step mode

The **no** form of this command removes the PTP clock-step configuration of the PTP clock.

Parameter	Description
`one-step`	Sets the PTP clock-step mode to one-step messaging in which egress-time information is sent along with the SYNC message.
`two-step`	Sets the PTP clock-step mode to two-step messaging in which egress-time information is sent a subsequent follow-up message with the egress timestamp of the previously sent SYNC message.

Usage

- Mandatory command to start the PTP clock.
- Boundary clocks can inter-operate with different step modes upstream or downstream.

Example

Setting the clock-step mode to one-step messaging:

```
switch(config-ptp)# clock-step one-step
```

Removing the clock-step mode configuration:

```
switch(config-ptp)# no clock-step
```

Setting the clock-step mode to two-step messaging:

```
switch(config-ptp)# clock-step two-step
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.11	For boundary clock, added support for the **two-step** parameter on the 6300 Switch Series (models R8S89A and R8S90A).
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-ptp`	Administrators or local user group members with execution rights for this command.

enable

```
enable
no enable
```

Description

Enables the PTP profile globally. However, the PTP clock is started only when all the mandatory commands are set.

The **no** form of this command disables the PTP profile globally.

Usage

Mandatory command to start the PTP clock.

Examples

Enabling the PTP profile:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# enable
```

Disabling the PTP profile:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# no enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-ptp`	Administrators or local user group members with execution rights for this command.

mode

```
mode boundary {end-to-end | peer-to-peer}
no mode boundary {end-to-end | peer-to-peer}
mode transparent {end-to-end | peer-to-peer}
no mode transparent {end-to-end | peer-to-peer}
no mode
```

Description

Configures the switch PTP clock mode, either boundary or transparent, with a delay-request mechanism of either end-to-end or peer-to-peer. A device in transparent clock mode does not synchronize (syntonize) itself to a grandsource clock.

> On the Aruba 6300 Switch Series, boundary clock (one-step and two-step modes) are available only on models R8S89A and R8S90A. All other Aruba 6300 Switch Series models support only transparent clock (E2E and P2P). A VSF stack only supports E2E mode.

The **no** form of this command unconfigures the PTP clock mode and delay-request mechanism.

Parameter	Description
`boundary`	Selects boundary clock mode.
`transparent`	Selects transparent clock mode.
`end-to-end`	Selects the end-to-end delay-request mechanism.
`peer-to-peer`	Selects the peer-to-peer delay-request mechanism. Not supported with VSF.

Examples

Configuring PTP boundary clock mode with the end-to-end delay-request mechanism:

```
switch(config-ptp)# mode boundary end-to-end
```

Unconfiguring PTP boundary clock mode with the end-to-end delay-request mechanism:

```
switch(config-ptp)# no mode boundary end-to-end
```

Configuring PTP boundary clock mode with the peer-to-peer delay-request mechanism:

```
switch(config-ptp)# mode boundary peer-to-peer
```

Unconfiguring PTP boundary clock mode with the peer-to-peer delay-request mechanism:

```
switch(config-ptp)# no mode boundary peer-to-peer
```

Configuring PTP transparent with the end-to-end delay-request mechanism:

```
switch(config-ptp)# mode transparent end-to-end
```

Unconfiguring PTP transparent with the end-to-end delay-request mechanism:

```
switch(config-ptp)# no mode transparent end-to-end
```

Configuring PTP transparent with the peer-to-peer delay-request mechanism:

```
switch(config-ptp)# mode transparent peer-to-peer
```

Unconfiguring PTP transparent with the peer-to-peer delay-request mechanism:

```
switch(config-ptp)# no mode transparent peer-to-peer
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.11	Added support for the **peer-to-peer** delay-request mechanism.
10.10.1000	Added boundary clock to the 6300 Switch Series models R8S89A and, R8S90A.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-ptp`	Administrators or local user group members with execution rights for this command.

priority1

```
priority1 <PRIORITY>
no priority1
```

Description

Configures the PTP clock **priority1** value of the device. This value is operational when the device is in boundary clock mode and participating in the Best Clock Source Algorithm (BMCA). This value is used to indicate priority to its downstream clock-aware devices.

The **no** form of this command removes the PTP **priority1** configuration of the PTP clock and sets it to the default value of 128.

Parameter	Description
<PRIORITY>	Sets the priority value. Default 128.

Usage

This value can be configured only for the boundary clock.

Examples

Configuring PTP priority1 value:

```
switch(config-ptp)# priority1 129
```

Removing PTP priority1 configuration:

```
switch(config-ptp)# no priority1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	config-ptp	Administrators or local user group members with execution rights for this command.

priority2

```
priority2 <PRIORITY>
no priority2 <PRIORITY>
```

Description

Configures the PTP clock **priority2** value of the device. This value is operational when the device is in boundary clock mode and participating in the Best Clock Source Algorithm (BMCA). This value is used to indicate priority to its downstream clock-aware devices.

The **no** form of this command removes the PTP **priority2** configuration of the PTP clock and sets it to the default value of 128.

Parameter	Description
<PRIORITY>	Sets the priority value. Default 128.

Usage

This value can be configured only for the boundary clock.

Examples

Configuring PTP `priority2` value:

```
switch(config-ptp)# priority2 129
```

Removing PTP priority2 configuration:

```
switch(config-ptp)# no priority2
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-ptp`	Administrators or local user group members with execution rights for this command.

ptp announce-interval

```
ptp announce-interval {1588v2| aes67 | aes-r16 | dot1as | smpte} <LOG-SECONDS>
no ptp announce-interval {1588v2| aes67 | aes-r16 | dot1as | smpte}
```

Description

Sets the announce message transmit interval on a PTP-enabled interface for a specific PTP profile.

The **no** form of this command removes the announce message transmit interval configuration on a PTP-enabled interface and sets a profile specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default: 1.
`aes67`	Specifies the PTP AES67 profile timers. Default: 1.
`aes-r16`	Specifies the PTP AES-R16 profile timers. Default: 1.
`dot1as`	Specifies the PTP 802.1 AS profile timers. Default: 0.
`smpte`	Specifies the PTP SMTPE profile timers. Default: -2.
`<LOG-SECONDS>`	Sets the announce message interval in log seconds.

Usage

This value can be configured only for the boundary clock.

Examples

Setting the PTP 1588v2 profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp announce-interval 1588v2 1
```

Setting the PTP AES67 profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp announce-interval aes67 2
```

Removing the PTP AES67 profile timer configuration:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp announce-interval aes67
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Support extended for 802.1AS profile.
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp announce-timeout

```
ptp announce-timeout {1588v2| aes67 | aes-r16 | dot1as | smpte} <COUNT>
no ptp announce-timeout {1588v2| aes67 | aes-r16 | dot1as | smpte}
```

Description

Sets the announce message receipt timeout on a PTP-enabled interface for a specific PTP profile.

The **no** form of this command resets the announce message receipt timeout configuration on a PTP-enabled interface and sets a profile-specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default: 3.
`aes67`	Specifies the PTP AES67 profile timers. Default: 3.
`aes-r16`	Specifies the PTP AES-R16 profile timers. Default: 3.
`dot1as`	Specifies the PTP 802.1AS profile timers. Default: 3.
`smpte`	Specifies the PTP SMTPE profile timers. Default: 3.
`<LOG-SECONDS>`	Specifies the number of announcement intervals.

Usage

This value can be configured only for the boundary clock.

Examples

Setting the PTP 1588v profile timer:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp announce-timeout 1588v2
```

Setting the PTP AES67 profile timer:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp announce-timeout aes67 4
```

Resetting the PTP AES67 profile timer:

```
switch(config)# interface 1/1/1
switch(config-if)#no ptp announce-timeout aes67
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Support extended for 802.1AS profile.
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp clock-source-only

```
ptp clock-source-only
no ptp clock-source-only
```

Description

Configures the PTP port state to clock_source state. This prohibits the port from entering into a clock_ sink or passive state.

The **no** form of this command removes the clock_source state configuration on the port and returns it to normal BMCA operation.

Usage

This can only be configured for the boundary clock.

Examples

Configuring the clock_source only role for the port:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp clock-source-only
```

Removing the configuration of clock_source only role for the port:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp clock-source-only
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp delay-req-interval

```
ptp delay-req-interval {1588v2 | aes67 | aes-r16 | smpte} <LOG-SECONDS>
no ptp delay-req-interval {1588v2 | aes67 | aes-r16 | smpte}
```

Description

Sets the **delay_req** message transmit interval on a PTP-enabled interface for a specific PTP profile.

The **no** form of this command removes the **delay_req** message transmit interval configuration on a PTP-enabled interface and sets a profile specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default 0.
`aes67`	Specifies the PTP AES67 profile timers. Default 0.
`aes-r16`	Specifies the PTP AES-R16 profile timers. Default 0.
`smpte`	Specifies the PTP SMTPE profile timers. Default -3.
`<LOG-SECONDS>`	Sets the **delay_req** message interval in log seconds.

Usage

- Use this command for end-to-end (E2E) mode and use command **ptp pdelay-interval** for peer-to-peer mode.
- This command is only for boundary clock.

Examples

Setting the PTP 1588v2 profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp delay-req-interval 1588v2 2
```

Removing a PTP 1588v2 profile timer configuration:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp delay-req-interval 1588v2
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp enable

```
ptp enable
no ptp enable
```

Description

Enables PTP on the interface. The **no** form of this command disables PTP on the interface. PTP can be enabled only on physical L2 or L3 interfaces and LAG L2 or L3 interfaces.

Examples

Enabling PTP on a physical interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp enable
```

Disabling PTP on the interface context:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-if`	Administrators or local user group members with execution rights for this command.

ptp lag-role

```
ptp lag-role {primary | secondary}
no ptp lag-role
```

Description

Configures the PTP role for the member interfaces of a Link Aggregation (LAG) . When there are two or more member interfaces for a LAG, only one link can be configured as primary and only one other link can be configured as secondary. The primary member interface is used for transmitting the PTP packets generated by the boundary clock. When the primary member goes down, the secondary member is used for PTP packet transmission. If both primary and secondary members go down, PTP does not flip over to the other links of the LAG.

The **no** form of this command removes the PTP role configuration for the LAG member interface.

This command is not supported when configured as a transparent clock.

Parameter	Description
`primary`	Sets the primary PTP lag-role for the LAG member interface.
`secondary`	Sets the secondary PTP lag-role for the LAG member interface.

Usage

- LAG roles must be configured for boundary clock.
- For the primary or secondary LAG roles, ensure that the same link ports are configured on both ends of the LAG.

Examples

Setting the primary PTP lag-role for the LAG member interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp lag-role primary
```

Setting the secondary PTP lag-role for the LAG member interface:

```
switch(config)# interface 1/1/2
switch(config-if)# ptp lag-role secondary
```

Removing the PTP lag-role configuration for the LAG member interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp lag-role
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp neighbor-propagation-delay-threshold

`ptp neighbor-propagation-delay-threshold <threshold value>`

Description

Configures PTP neighbor propagation delay threshold in nanoseconds.

The **no** form of this command removes the PTP neighbor propagation delay threshold configuration.

Parameter	Description
<threshold value>	Sets the PTP neighbor propagation delay threshold in nanoseconds. The supported range is 0-2147483648. Default threshold value: 800 nanoseconds.

Examples

Setting the PTP neighbor-propagation-delay-threshold:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp neighbor-propagation-delay-threshold 200
```

Removing the PTP neighbor-propagation-delay-threshold:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp neighbor-propagation-delay-threshold
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp pdelay-req-interval

```
ptp pdelay-req-interval {1588v2| aes67 | aes-r16 | dot1as | smpte} <LOG-SECONDS>
no ptp pdelay-req-interval {1588v2| aes67 | aes-r16 | dot1as | smpte}
```

Description

Sets the **pdelay_req** message transmit interval on a PTP-enabled interface for a specific PTP profile.

The **no** form of this command removes the **pdelay_req** message transmit interval configuration on a PTP-enabled interface and sets a profile specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default 0.
`aes67`	Specifies the PTP AES67 profile timers. Default 0.
`aes-r16`	Specifies the PTP AES-R16 profile timers. Default 0.
`dot1as`	Specifies the PTP 802.1AS profile timers. Default: 0.
`smpte`	Specifies the PTP SMTPE profile timers. Default -3.
<LOG-SECONDS>	Sets the delay_req message interval in log seconds.

Usage

- Use this command for peer-to-peer (P2P) mode and use command **ptp delay-interval** for end-to-end (E2E) mode.

Examples

Setting the PTP 1588v2 profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp pdelay-req-interval 1588v2 2
```

Removing the PTP 1588v2 profile timer configuration:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp pdelay-req-interval 1588v2
```

Setting the PTP AES67 profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp pdelay-req-interval aes67 1
```

Removing the PTP AES67 profile timer configuration:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp pdelay-req-interval aes67
```

Setting the PTP smpte profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp pdelay-req-interval smpte 1
```

```
Removing the PTP smpte  profile timer configuration:
```

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp pdelay-req-interval smpte
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Support extended for 802.1AS profile.
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp peer ip

```
ptp peer ip <IP-ADDRESS>
no ptp peer ip <IP-ADDRESS>
```

Description

Configures destination IP addresses for the interfaces in unicast transmission. The **no** form of this command removes the PTP destination IP address configuration for the interfaces in unicast transmission.

Parameter	Description
`ip <IP-ADDRESS>`	Specifies the peer IPv4 address. Syntax: A.B.C.D

Usage

- This command has no effect when configured as a transparent clock.

Example

Configuring `ptp peer ip` on the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp peer ip 10.0.0.1
```

Removing `ptp peer ip` on the interface:

```
switch(config-if)# no ptp peer ip 10.0.0.1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp profile

```
ptp profile {<PROFILE NAME>}
no ptp profile
```

Description

Enters the PTP context to configure the PTP profile in which the device will operate.

Configure PTP profile before configuring mode or other profile-specific parameters. The device can be operating in any one profile at a given point of time. The **no** form of this command removes the PTP profile configuration in which the device will operate. This command clears the PTP profile and all parameters related to that profile.

Parameter	Description
<PROFILE NAME>	Specifies the profile to be used. Profiles include: ▪ 1588v2: Specifies the IEEE 1588-2008 profile to be used. ▪ aes-r16: Specifies the IEEE AES-R16-2016 profile to be used. ▪ aes67: Specifies the IEEE AES67 profile to be used. ▪ dot1as: Specifies the IEEE 802.1AS profile to be used. ▪ smpte: Specifies the IEEE SMPTE-ST-2059-2 profile to be used. **NOTE:** The 802.1AS (2011) PTP profile specification supports only two-step clock, Ethernet transport, and peer-to-peer delay mechanism. The 802.1AS PTP profile is supported only on following SKUs: JL717C, JL718C, JL719C, JL721C, JL722C, R8S89A, and R8S90A.

Usage

Configure PTP profile before configuring mode or other profile-specific parameters.

Example

Configuring PTP profiles:

```
switch(config)# ptp profile 1588v2
```

Configuring PTP profiles:

```
switch(config)# ptp profile dot1as
```

Configuring more than one PTP profile:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# exit
switch(config)# ptp profile smpte
switch(config-ptp)#
The existing profile must be removed using the 'no ptp profile' command before
configuring a different profile.
```

Configuring Ethernet transport for the 802.1AS PTP profile:

```
switch(config)# ptp profile dot1as
switch(config-ptp)# transport-protocol ethernet
```

Configuring peer-to-peer delay mechanism for the 802.1AS PTP profile:

```
switch(config)# ptp profile dot1as
switch(config-ptp)# mode boundary peer-to-peer
```

Configuring two-setp clock for the 802.1AS PTP profile:

```
switch(config)# ptp profile dot1as
switch(config-ptp)# clock-step two-step
```

Removing the PTP profile:

```
switch(config-ptp)# no ptp profile
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Support extended for 802.1AS profile.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config`	Administrators or local user group members with execution rights for this command.

ptp sync-interval

```
ptp sync-interval {1588v2 | dot1as | aes67 | smpte} <LOG-SECONDS>
no ptp sync-interval {1588v2 | dot1as | aes67 | smpte} <LOG-SECONDS>
```

Description

Sets the sync message transmit interval on a PTP-enabled interface for a specific PTP profile.

The **no** form of this command removes the sync message transmit interval configuration on a PTP enabled interface and sets it to a profile-specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default 0.
`dot1as`	Specifies the PTP 802.1 AS profile timers. Default -3.
`aes67`	Specifies the PTP AES67 profile timers. Default -3.
`smpte`	Specifies the PTP SMTPE profile timers. Default -3
`<LOG-SECONDS>`	Sets the sync message interval in log seconds.

Examples

Setting the PTP 802.1 AS sync interval :

```
switch(config)# interface 1/1/1
switch(config-if)# ptp sync-interval dot1as -2
```

Setting the PTP 1588v2 sync interval :

```
switch(config)# interface 1/1/1
switch(config-if)# ptp sync-interval 1588v2 2
```

Setting the PTP AES67 sync interval :

```
switch(config)# interface 1/1/1
switch(config-if)# ptp sync-interval aes67 -2
```

Removing the PTP AES67 sync interval:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp sync-interval aes67
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Support extended for 802.1AS profile.
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp sync-timeout

```
ptp sync-timeout dot1as <COUNT>
no ptp sync-timeout dot1as
```

Description

Sets the synchronization message receipt timeout on a PTP enabled interface.

The **no** form of this command resets the synchronization message receipt timeout configuration on a PTP-enabled interface and sets a profile-specific default value.

Parameter	Description
`dot1as`	Specifies the PTP 802.1AS profile timers. Default: 3.
`<LOG-SECONDS>`	Specifies the number of announcement intervals.

Examples

Setting the PTP 802.1 AS profile timer:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp sync-timeout dot1as 4
```

Resetting the PTP 802.1 AS profile timer:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp sync-timeout dot1as
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

ptp vlan

```
ptp vlan <VLAN-ID>
no ptp vlan
```

Description

Configures a VLAN for PTP messages. It is necessary when the boundary clock port is a VLAN trunk L2 interface (**no routing**). The **no** form of this command removes the VLAN configuration for PTP messages.

Parameter	Description
<VLAN-ID>	Specifies a VLAN. Range: 1-4094.

Usage

- This configuration has no bearing on the one-step transparent clock.
- In boundary clock mode, only PTP packets in PTP VLAN are processed; PTP packets from other VLANs are dropped.
- **ptp vlan** should be configured on interfaces only when the specific VLAN is a trunk/tagged member of that port. This configuration should not be performed on an access port.

Examples

Configuring a specific VLAN for PTP messages:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp vlan 4
```

Removing the VLAN configuration for PTP messages:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp vlan
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	`config-if`	Administrators or local user group members with execution rights for this command.

show ptp clock

```
show ptp clock
```

Description

Shows PTP clock-related information.

Example

Showing PTP transparent clock information:

```
switch# show ptp clock
PTP Profile                          : smpte
PTP Mode                             : transparent
Delay Mechanism                      : end-to-end
Clock Identity                       : NA
Network Transport Protocol           : ipv4
Clock Step                           : One
Clock Domain                         : NA
Number of PTP Ports                  : 1
Priority1                            : NA
Priority2                            : NA
Clock Quality :
  Class                              : NA
  Accuracy                           : NA
  Offset (log variance)              : NA
Offset From Clock-Source             : NA
Mean Delay                           : NA
Steps Removed                        : NA
```

Showing PTP boundary clock information (boundary clock is available only on the 6300 Switch Series models R8S89A and R8S90A that first released with AOS-CX 10.10.1000):

```
switch# show ptp clock
PTP Profile                          : aes67
PTP Mode                             : boundary
Delay Mechanism                      : end-to-end
Clock Identity                       : 00:fd:45:ff:fe:68:f3:00
Network Transport Protocol           : ipv4
Clock Step                           : Two
Clock Domain                         : 0
Number of PTP Ports                  : 3
Priority1                            : 128
```

```
Priority2                                    : 128

Clock Quality :
  Class                                      : 248
  Accuracy                                   : 49
  Offset (log variance)                      : 52592

Offset From Clock-Source                     : - 0.000000006  (s)
Mean Delay                                   : + 0.000000277  (s)
Steps Removed                                : 1
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only.

show ptp foreign-clock-sources

```
show ptp foreign-clock-sources
```

Description

Shows the priority1, priority2, class, accuracy, offset-scaled-log-variance (OSLV), and steps removed information for foreign clock-source nodes.

Example

Showing PTP foreign clock-source information:

```
switch(config-if)# show ptp foreign-clock-sources
P1=Priority1, P2=Priority2, C=Class, A=Accuracy,
OSLV=Offset-scaled-log-variance, SR=Steps-removed

---------- -------------------------------- ------------------------ ---- ---- ---- ---- ------ ---
Interface  Foreign Port ID                  Clock Source ID          P1   P2   C    A    OSLV   SR
---------- -------------------------------- ------------------------ ---- ---- ---- ---- ------ ---
1/1/4      00:00:00:00:00:00:00:01(0x0001)  00:00:00:00:00:00:00:01  0    0    6    35   0      1
1/1/5      b4:99:ba:ff:fe:54:2b:00(0x0002)  00:00:00:00:00:00:00:01  0    0    6    35   0      2
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	Manager (#)	Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only.

show ptp interface

```
show ptp interface [<IFNAME> profile-data dot1as | [brief]
```

Description

Shows PTP port-related information.

Parameter	Description
<IFNAME>	Specifies the interface name.
`profile-data`	Shows additional information of the profile.
`dot1as`	Shows port data specific to the 802.1 AS profile.
`brief`	Shows information in a brief format.

Examples

Showing PTP port information when the switch is acting as a transparent clock:

```
switch# show ptp interface 1/1/1
Port Identity                           : 00:00:00:00:00:00:00:00 (0x0000)
Port Number                             : 0
PTP Version                             : 2
PTP Enable                              : Enabled
PTP Transport                           : ipv4
Port State                              : Disabled
Delay Mechanism                         : peer-to-peer
Announce Interval (log mean)            : 0
Announce Receipt Timeout                : 0
Sync Interval (log mean)                : 0
Sync Timeout                            : NA
Delay Request Interval (log mean)       : NA
Peer Delay Request Interval (log mean)  : 0
```

```
Mean Path Delay                          : 0 (ns)
switch#

switch# show ptp interface lag20
Port Identity                            : NA
Port Number                              : NA
PTP Version                              : 2
PTP Enable                               : Enabled
Transport of PTP                         : ipv4
Port State                               : NA
Delay Mechanism                          : end-to-end
Announce Interval (log mean)             : NA
Announce Receipt Timeout                 : NA
Sync Interval (log mean)                 : NA
Sync Timeout                             : NA
Delay Request Interval (log mean)        : N
Peer Delay Request Interval (log mean)   : 0
Mean Path Delay                          : 0 (ns)
switch#
```

Showing PTP port information when the switch is acting as a boundary clock (boundary clock is available only on the 6300 Switch Series models R8S89A and R8S90A that first released with AOS-CX 10.10.1000):

```
switch# show ptp interface 1/1/1
Interface : 1/1/1
Port Identity                            : 88:3a:30:ff:fe:05:c9:80 (port: 0x0002)
Port Number                              : 2
PTP Version                              : 2
PTP Enable                               : Enabled
Transport of PTP                         : ethernet
Port State                               : Clock Source
Delay Mechanism                          : end-to-end
Announce Interval (log mean)             : 0
Announce Receipt Timeout                 : 3
Sync Interval (log mean)                 : -3
Sync Timeout                             : NA
Delay Request Interval (log mean)        : 0
Peer Delay Request Interval (log mean)   : 0
Mean Path Delay                          : 0 (ns)

switch# show ptp interface lag1
Port Identity                            : 00:fd:45:ff:fe:68:f3:00 (port: 0x0002)
Port Number                              : 2
PTP Version                              : 2
PTP Enable                               : Enabled
Transport of PTP                         : ipv4
Port State                               : Clock Source
Delay Mechanism                          : end-to-end
Announce Interval (log mean)             : 0
Announce Receipt Timeout                 : 3
Sync Interval (log mean)                 : -3
Sync Timeout                             : NA
Delay Request Interval (log mean)        : -3
Peer Delay Request Interval (log mean)   : 0
Mean Path Delay                          : 0 (ns)
Primary Interface                        : 1/1/5
Secondary Interface                      : 1/1/6

switch# show ptp interface
Interface lag20:
Port Identity                            : 00:fd:45:ff:fe:68:f3:00 (port: 0x0002)
Port Number                            : 2
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Clock Source
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3
Peer Delay Request Interval (log mean) : 0
Mean Path Delay                        : 0 (ns)
Primary Interface                      : 1/1/5
Secondary Interface                    : 1/1/6

Member Interface 1/1/5:
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0002)
Port Number                            : 2
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Running
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3
Peer Delay Request Interval (log mean) : 0
Mean Path Delay                        : 0 (ns)

Member Interface 1/1/6:
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0003)
Port Number                            : 3
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Not Running
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3
Peer Delay Request Interval (log mean) : 0
Mean Path Delay                        : 0 (ns)

Interface 1/1/15:
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0001)
Port Number                            : 1
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Clock Sink
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3
Peer Delay Request Interval (log mean) : 0
```

```
Mean Path Delay                               : 0 (ns)
```

Showing PTP port information (in brief form) when the switch is acting as a boundary clock (boundary clock is available only on the 6300 Switch Series models R8S89A and R8S90A that first released with AOS-CX 10.10.1000):

```
switch# show ptp interface brief
Interface      PTP State
--------------------------
1/1/11         Clock Sink
1/1/12         Clock Source
1/1/15         Clock Source
1/1/16         Clock Source
```

Showing PTP port information of 802.1AS profile:

```
switch# show ptp int 1/1/1 profile-data dot1as
asCapable                           : TRUE
Compute Neighbor RateRatio          : TRUE
Neighbor RateRatio                  : 1.2
Compute Neighbor PropDelay          : TRUE
Neighbor Propagation Delay          : 35 ns
PDelay Lost Response Threshold      : 3
Lost Response Threshold Exceeded : FALSE
```

Showing PTP port information in brief format:

Showing PTP port information in brief format:

```
switch# show ptp interface brief
Interface  PTP State
--------------------------
1/1/1     Running
1/1/2     Running
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.13	Support extended for 802.1AS profile.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only.

show ptp parent

`show ptp parent`

Description

Shows parent node information for the PTP device.

Example

Showing PTP parent node information:

```
switch# show ptp parent
PTP Parent Properties

Parent Clock
----------------------------
Parent Clock Identity                  : 00:00:00:00:00:00:00:01
Parent Port Number                     :  0x0001
Observed Parent Offset (log variance)  : 65535
Observed Parent Clock Phase Change Rate: 2147483647

Grandsource Clock
----------------------------
Grandsource Clock Identity             : 00:00:00:00:00:00:00:01
Grandsource Clock Quality
  Class                                : 6
  Accuracy                             : 35
  Offset (log variance)                : 0
Priority1                              : 0
Priority2                              : 0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	Manager (#)	Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only.

show ptp statistics

```
show ptp statistics [<IFNAME>]
```

Description

Shows PTP port statistics.

Parameter	Description
<IFNAME>	Optional. Specifies the interface name.

Examples

Showing PTP port statistics:

```
switch# show ptp statistics

PTP Interface Statistics

                 Received Packets    Sent Packets    Discarded Packets    Lost Packets
Interface: 1/1/15
    Announce                    0            1019                    0               0
    Sync                        0            2038                    0               0
    Signaling                   0               0                    0               0
    DelayReq                    0               0                    0               0
    DelayResp                   0               0                    0               0
    FollowUp                    0               0                    0               0
    PdelayReq               81957          655750                    0               0
    PdelayResp             655750           81957                    0               0
    PdelayRespFollowUp     655749           81957                    0               0
    Management                  0               0                    0               0

                 Received Packets    Sent Packets    Discarded Packets    Lost Packets
Interface: 1/1/16
    Announce                    0            1019                    0               0
    Sync                        0            2038                    0               0
    Signaling                   0               0                    0               0
    DelayReq                    0               0                    0               0
    DelayResp                   0               0                    0               0
    FollowUp                    0               0                    0               0
    PdelayReq               81957          655750                    0               0
    PdelayResp             655750           81957                    0               0
    PdelayRespFollowUp     655749           81957                    0               0
    Management                  0               0                    0               0
```

Showing PTP port statistics for the specified interface:

```
switch# show ptp statistics 1/1/15

PTP Interface Statistics

                 Received Packets    Sent Packets    Discarded Packets    Lost Packets
Interface: 1/1/15
    Announce                    0            1024                    0               0
    Sync                        0            2048                    0               0
    Signaling                   0               0                    0               0
    DelayReq                    0               0                    0               0
    DelayResp                   0               0                    0               0
    FollowUp                    0               0                    0               0
    PdelayReq               81957          655750                    0               0
    PdelayResp             655750           81957                    0               0
    PdelayRespFollowUp     655749           81957                    0               0
    Management                  0               0                    0               0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Administrators or local user group members with execution rights for this command.

show ptp time-property

```
show ptp time-property
```

Description

Shows PTP clock-time properties for the PTP device.

Parameter	Description

Example

Showing PTP clock time properties:

```
switch # show ptp time-property
PTP Clock Time Property
----------------------------
Current UTC Offset Valid  : FALSE
Current UTC Offset        : 37
```

```
Leap59                      : FALSE
Leap61                      : FALSE
Time Traceable              : FALSE
Frequency Traceable         : FALSE
PTP Timescale               : FALSE
Synchronization Uncertain   : FALSE
Time Source                 : 160
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.10.1000	Command introduced on the 6300 Switch Series.

Command Information

Platforms	Command context	Authority
6300 (only R8S89A, R8S90A)	Manager (#)	Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only.

show running-config ptp

`show running-config ptp`

Description

Shows PTP running configuration related information.

Example

Showing PTP running configuration information (boundary clock is available only on the 6300 Switch Series models R8S89A and R8S90A that first released with AOS-CX 10.10.1000):

```
switch# show running-config ptp
ptp profile smpte
    enable
    clock-step two-step
    transport-protocol ipv4
    mode boundary peer-to-peer
interface 1/1/15
    no shutdown
    ip address 30.1.1.1/16
    ptp enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	Manager (#)	Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only.

transport-protocol

```
transport-protocol {ethernet | ip}
no transport-protocol
```

Description

Sets the transport protocol for PTP packets. In the case of IPv4, the UDP check-sum is reset. There is no default transport-protocol. The **no** form of this command disconnects the clock from its source.

Parameter	Description
`ethernet`	Specifies the Ethernet (Layer 2) transport protocol.
`ip`	Specifies the IPv4 transport protocol.

Usage

Mandatory command to start the PTP clock.

Example

Setting the Ethernet transport protocol for PTP packets:

```
switch(config-ptp)# transport-protocol ethernet
```

Removing the transport protocol for PTP packets:

```
switch(config-ptp)# no transport-protocol
```

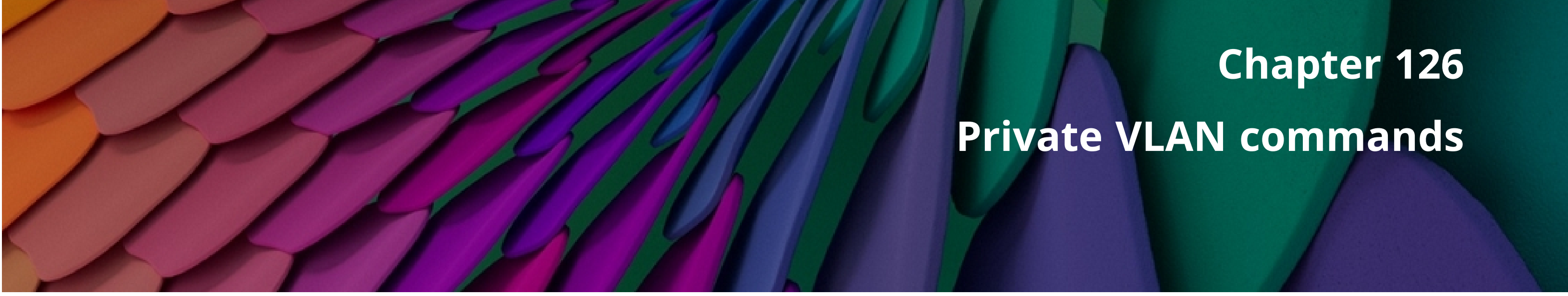
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

Command History

Release	Modification
10.14	Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated.
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
6300	`config-ptp`	Administrators or local user group members with execution rights for this command.



Chapter 126

Private VLAN commands

diag-dump private-vlan basic

```
diag-dump private-vlan basic
```

Description

Collects the debug information in the case of any issue in the PVLAN feature.

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

private-vlan

```
private-vlan {primary | isolated | community} primary-vlan <VLAN-ID>
no private-vlan {primary | isolated | community} primary-vlan <VLAN-ID>
```

Description

Configures a VLAN as either a primary, isolated, or community private VLAN and associates secondary VLANs to a primary VLAN.

The **no** form of this command removes the private VLAN configuration of a VLAN.

Parameter	Description
`primary`	Configures the VLAN as PVLAN type primary. **NOTE:** The number of primary VLANs are restricted to 512

Parameter	Description
	instances for the Aruba 10000 Switch Series. All other switches that support PVLAN support up to 32 primary VLAN instances. Up to 8 secondary VLANs can be configured under a primary VLAN for the Aruba 4100i, 6000, and 6100 Switch Series. Up to 24 secondary VLANs can be configured under a primary VLAN for the Aruba 6200, 6300, 6400, 8325, 8360, and 10000 Switch Series.
`isolated`	Configures the VLAN as PVLAN type isolated.
`community`	Configures the VLAN as PVLAN type community.
<VLAN-ID>	Specifies the primary VLAN ID to be associated. Range: 2-4094.

Examples

Configuring VLAN 100 as PVLAN type primary

```
switch(config)# vlan 100
switch(config-vlan-100)# private-vlan primary
```

Removing the private VLAN configuration from VLAN 100

```
switch(config)# vlan 100
switch(config-vlan-100)# no private-vlan primary
```

Associating community VLAN 200 with primary VLAN 100

```
switch(config)# vlan 200
switch(config-vlan-200)# private-vlan community primary-vlan 100
```

Removing the association of community VLAN 200 from primary VLAN 100

```
switch(config)# vlan 200
switch(config-vlan-200)# no private-vlan community primary-vlan 100
```

Associating isolated VLAN 300 with primary VLAN 100

```
switch(config)# vlan 300
switch(config-vlan-300)# private-vlan isolated primary-vlan 100
```

Removing the association of isolated VLAN 300 from primary VLAN 100

```
switch(config)# vlan 300
switch(config-vlan-300)# no private-vlan isolated primary-vlan 100
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	`config-vlan-<VLAN-ID>`	Administrators or local user group members with execution rights for this command.

private-vlan port-type

```
private-vlan port-type {promiscuous | secondary}
no private-vlan port-type {promiscuous | secondary}
```

Description

Configures a port as either promiscuous or secondary when in the **interface** context. Configures PVLAN port type for a role when in the **config-pa-role** context. Multiple secondary VLANs associated with the same primary VLAN cannot be tagged under a secondary port.

The **no** form of this command removes the PVLAN port type configuration.

When an interface has been configured as "vlan trunk allowed all" `private-vlan port-type` cannot be configured.

Parameter	Description
`promiscuous`	Configures the port as promiscuous.
`secondary`	Configures the port as secondary.

Examples

Configuring interface 1/1/1 as promiscuous:

```
switch(config)# interface 1/1/1
switch(config-if)# private-vlan port-type promiscuous
```

Configuring port type as secondary for the port access role:

```
switch(config)# port-access role Role1
switch(config-pa-role)# private-vlan port-type secondary
```

Removing the promiscuous configuration from interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no private-vlan port-type promiscuous
```

Removing port type as secondary for the port access role:

```
switch(config)# port-access role Role1
switch(config-pa-role)# no private-vlan port-type secondary
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	`config-if` `config-pa-role`	Administrators or local user group members with execution rights for this command.

show capacities private-vlan

`show capacities private-vlan`

Description

Shows the maximum number of primary and secondary VLANs per domain and secondary ports per LC that can be configured.

Examples

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show capacities-status private-vlan

```
show capacities-status private-vlan
```

Description

Shows the number of primary VLANs currently configured and the maximum capacity of primary VLANs on the switch.

Examples

Showing the current capacity status of private-VLAN on the switch

```
switch# show capacities-status private-vlan
System Capacities Status: Filter Private-VLAN
Capacities Status Name                                          Value Maximum
---------------------------------------------------------------
Number of Private-VLAN domains currently configured                 2       32
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show private-vlan

```
show private-vlan [type {<VLAN-ID> | primary | isolated | community}]
```

Description

Shows the private VLAN configuration for all private VLANs or the private VLAN type specified.

Parameter	Description
`<VLAN-ID>`	Specifies a list of VLANs. Range: 2-4094.
`primary`	Shows primary private VLANs.
`isolated`	Shows isolated private VLANs.
`community`	Shows community private VLANs.

Examples

Showing all private VLANs

```
switch# show private-vlan
----------------------------------------------
Primary   Isolated          Community
----------------------------------------------
100       201               -
342       -                 1342,3000-3022
343       -                 1343
344       -                 1344
345       -                 1345
```

Showing private VLANs 100 through 102

```
switch# show private-vlan type 100-102
-------------------
VLAN       Type
-------------------
100        Primary
101        Isolated
102        Community
```

Showing all primary VLANs

```
switch# show private-vlan type primary
-------------------
VLAN       Type
-------------------
100        Primary
200        Primary
300        Primary
400        Primary
500        Primary
600        Primary
605        Primary
700        Primary
705        Primary
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show private-vlan association

```
show private-vlan association <VLAN-ID>
```

Description

Shows primary and secondary VLAN associations for all private VLANs or a specified private VLAN.

Parameter	Description
<VLAN-ID>	Specifies a list of VLANs. Range: 2-4094.

Examples

Showing all private VLAN associations

```
switch# show private-vlan association
----------------------------------------------------
Primary   Isolated   Community
----------------------------------------------------
100       101        102,103
200       201        205,210-214
300       301        -
400       -          405-410,411
500       -          502,504,506-508,510,512,514,
                     516,518
600       601,603,   -
605
700       701,703,   707-709,711,713-715,717-719,
          705        721,723-724
```

Showing private VLAN associations for VLAN 100

```
switch# show private-vlan association 100
```

```
---------------------------------------------------
Primary   Isolated   Community
---------------------------------------------------
100       101        102,103
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show private-vlan inconsistency

```
show private-vlan inconsistency
```

Description

Shows the list of interfaces and VLANs which are disabled or ignored by private VLAN due to private VLAN configuration and operational inconsistencies.

Possible interface inconsistencies:

- Hardware resource allocation failure
- Interface is a member of multiple secondary VLANs in the same domain
- Interface is a member of both primary and secondary VLAN
- Interface of private vlan port-type promiscuous is not allowed to join secondary VLAN
- Protocol VLANs and private VLANs are mutually exclusive features
- Interface of private vlan port-type secondary is not allowed to join the primary VLAN
- Interface has reached the private-vlan port limit of 24 ports
- Interface is a member of a secondary VLAN which has an SVI configured on it
- Interface **trunk-allowed-all** configuration is not allowed on promiscuous or secondary private-vlan port-type
- VSX ISL configuration is not allowed on private-vlan ports

Possible VLAN inconsistencies:

- Default VLAN is not allowed to join private-vlan domain
- ERPS instances must match for all VLANs in a private-VLAN domain
- VLAN has invalid or no private-vlan primary VLAN association
- MSTP instances must match for all VLANs in a private-VLAN domain
- MVRP and private-VLAN are mutually exclusive features
- VLAN has no primary associated VLAN
- VLAN has reached the private VLAN limit of 32 primary VLANs for the Aruba 4100i, 6000, 6100, 6200, 6300, 6400, 8325, and 8360 Switch Series. (The private VLAN limit is 512 on the Aruba 10000 Switch Series).
- RPVST and private VLAN are mutually exclusive features
- VLAN has reached the private VLAN limit of 24 secondary VLANs on the Aruba 6200, 6300, 6400, 8325, 8360, and 10000 Switch Series or 8 secondary VLANs on the Aruba 4100i, 6000, or 6100 Switch Series.
- Smartlink groups must match for all VLANs in a private-VLAN domain
- VLAN translation and private-VLAN are mutually exclusive features
- VLAN is a secondary VLAN with SVI configured
- Primary VLAN’s IGMP snooping configuration is applied
- Primary VLAN’s MLD snooping configuration is applied
- Primary VLAN’s ND snooping configuration is applied
- Primary VLAN’s DHCPV4 snooping configuration is applied
- Primary VLAN’s DHCPV6 snooping configuration is applied
- Primary VLAN’s CIPT configuration is applied

Examples

Showing interfaces which have been disabled due to private VLAN inconsistencies. In the example below vlan101, vlan201, and vlan301 are secondary VLANs:

```
switch# show private-vlan inconsistency
-------------------------------------------------------------------------
Interface/VLAN   Action    Inconsistency-Reason
-------------------------------------------------------------------------
1/1/1            Down      Interface is a member of multiple secondary VLANs
1/2/5            Down      Interface is a member of both primary and secondary
VLAN
vlan20           Down      VLAN has invalid or no private-vlan primary VLAN
association
vlan101          Ignore    Primary VLAN’s IGMP snooping config is applied.
vlan201          Ignore    Primary VLAN’s ND snooping config is applied.
vlan301          Ignore    Primary VLAN’s DHCPV4 snooping config is applied.
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show private-vlan port-type

```
show private-vlan port-type
```

Description

Shows all the private VLAN port type configurations.

Examples

Showing the ports with private-vlan port-type configuration

```
switch# show private-vlan port-type
----------------------------------------------------
Port            Port Type
---------------------------------------------------
1/1/1           promiscuous
1/1/2           secondary
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

Command History

Release	Modification
10.08	Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series

Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

show running-configuration private-vlan

```
show running-configuration private-vlan
```

Description

Shows all private VLAN configurations on the switch.

Examples

Showing the current private VLAN configuration

~~~~~~
switch# show running-configuration private-vlan
vlan 300
private-vlan type primary
vlan 100
private-vlan type isolated primary-vlan 300
vlan 200
private-vlan type community primary-vlan 300
interface 1/1/1
vlan trunk allowed 300
private-vlan port-type promiscuous
interface 1/1/2
vlan trunk allowed 100
private-vlan port-type secondary
interface 1/1/3
vlan trunk allowed 200
private-vlan port-type secondary
`````
~~~~~~

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show tech private-vlan

```
show tech private-vlan
```

### Description

Shows the output of **show tech** for the private-VLAN feature.

### Example

Showing the output of **show tech** for private-VLAN

```
switch# show tech private-vlan
====================================================
Show Tech executed on Mon Sep 28 06:05:02 2020
====================================================
====================================================
[Begin] Feature private-vlan
====================================================
*********************************
Command : show running-config private-vlan
*********************************
vlan 100
private-vlan primary
vlan 101
private-vlan isolated primary-vlan 100
vlan 102
private-vlan community primary-vlan 100
vlan 200
private-vlan primary
vlan 201
private-vlan community primary-vlan 200
interface 1/1/1
vlan access 1
private-vlan promiscuous
interface 1/1/2
vlan access 1
private-vlan secondary
*********************************
Command : show private-vlan type
*********************************
--------------------
VLAN      Type
--------------------
100       primary
101       isolated
102       community
200       primary
201       community
*********************************
Command : show private-vlan association
*********************************
---------------------------------------------
Primary   Isolated          Community
---------------------------------------------
100       101               102
200       -                 201
*********************************
Command : show private-vlan port-type
*********************************
----------------------
Port      Port-type
----------------------
1/1/1     promiscuous
1/1/2     secondary
====================================================
[End] Feature private-vlan
====================================================
====================================================
Show Tech commands executed successfully
====================================================
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced for 6200, 6300, 6400, 8100, 8360 Switch series |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## system private-vlan share-hw-resource

```
system private-vlan share-hw-resource
no system private-vlan share-hw-resource
```

### Description

Enables hardware resource sharing for private VLAN (PVLAN) secondary ports and enables you to configure additional secondary ports beyond the capacity limit.

There are no parameters for this command.

The **no** form of this command turns off the hardware resource sharing mode for PVLAN.

### Examples

Configure PVLAN default mode :

```
switch(config)# system private-vlan share-hw-resource
```

Unconfigure PVLAN default mode:

```
switch(config)# no system private-vlan share-hw-resource
```

This command will be available only on the platforms which had a limit of 24 PVLAN secondary ports in the legacy mode. For more information on features that use this command, refer to the *Private VLAN* topic in Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if`<br>`config-pa-role` | Administrators or local user group members with execution rights for this command. |

# Chapter 127
# QoS commands

## apply qos

```
apply qos [queue-profile <QUEUE-NAME>] schedule-profile <SCHEDULE-NAME>
no apply qos [queue-profile <QUEUE-NAME>] schedule-profile <SCHEDULE-NAME>
```

### Description

Applies a queue profile and schedule profile globally to all Ethernet and LAG interfaces on the switch, or applies a schedule profile to a specific interface. When applied globally, the specified schedule profile is configured only on Ethernet interfaces and LAGs that do not already have their own schedule profile.

The same profile can be applied both globally and locally to an interface. This guarantees that an interface always uses the specified profile, even if the global profile is changed.

The **no** form of this command removes the specified schedule profile from an interface and the interface uses the global schedule profile. This is the only way to remove a schedule profile override from the interface.

Interfaces may shut down briefly during reconfiguration.

| Parameter | Description |
|---|---|
| `queue-profile <QUEUE-NAME>` | Specifies the name of the queue profile to apply. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). This parameter is not supported in the **config-if** context. |
| `schedule-profile <SCHEDULE-NAME>` | Specifies the name of the schedule profile to apply. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |

### Usage

- The switch must always have a globally-applied queue and schedule profile. To stop using a given profile, apply a different profile.
- For a queue profile to be complete and ready to be applied, all eight local priorities must be mapped to a queue.
- For a schedule profile to be complete and ready to be applied, it must define all queues specified in the queue profile. All queues must use the same algorithm, except for the highest numbered queue, which can be **strict**.
- Both the queue profile and the schedule profile must specify the same number of queues.
- Schedule profiles can be modified while applied, but only in ways where a single command will not result in the profile becoming invalid. For example, queue 7 can have the algorithm changed, and weighted queues can have their weights changed.

- Queues must be consecutively defined starting at queue number zero. For example, a four-queue profile with priority values defined for queues 0, 1, 2, 3 is valid, but a four-queue profile which defines priority values for queues 1, 3, 5, and 7 is not.

If the number of queues was changed from the previous queue profile to the new one, any Ethernet or LAG interfaces with locally applied schedule profiles will program the newly applied global schedule-profile. The *show running-config interface* command will list the existing *apply qos schedule-profile* command with a comment describing the actual profile applied:

```
apply qos schedule-profile Old_Schedule
!actual schedule-profile New_Schedule
```

## Examples

The following commands illustrate a valid configuration where every local priority value is assigned to a queue and all assigned queues are defined:

```
switch(config)# qos cos-map 1 local-priority 1
switch(config)# qos queue-profile Q1
switch(config)# map queue 0 local-priority 0
switch(config)# map queue 1 local-priority 1
switch(config)# map queue 2 local-priority 2
switch(config)# map queue 3 local-priority 3
switch(config)# map queue 4 local-priority 4
switch(config)# map queue 5 local-priority 5
switch(config)# map queue 6 local-priority 6
switch(config)# map queue 7 local-priority 7
switch(config)# qos schedule-profile S1
switch(config)# dwrr queue 0 weight 5
switch(config)# dwrr queue 1 weight 10
switch(config)# dwrr queue 2 weight 15
switch(config)# dwrr queue 3 weight 20
switch(config)# dwrr queue 4 weight 25
switch(config)# dwrr queue 5 weight 50
```

The following commands illustrate an invalid configuration because local priority 2 is not assigned to a queue:

```
switch(config)# qos cos-map 1 local-priority 1
switch(config)# qos queue-profile Q1
switch(config)# map queue 0 local-priority 0
switch(config)# map queue 1 local-priority 1
switch(config)# map queue 3 local-priority 3
switch(config)# map queue 4 local-priority 4
switch(config)# map queue 5 local-priority 5
switch(config)# map queue 5 local-priority 6
switch(config)# map queue 5 local-priority 7
switch(config)# qos schedule-profile S1
switch(config)# dwrr queue 0 weight 5
switch(config)# dwrr queue 1 weight 10
switch(config)# dwrr queue 3 weight 15
switch(config)# dwrr queue 4 weight 25
switch(config)# dwrr queue 5 weight 50
```

Applying the QoS profile **Q1** and the schedule profile **S1** to all interfaces that do not have an applied interface-specific schedule profile:

```
switch(config)# apply qos queue-profile Q1 schedule-profile S1
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config`<br>`config-if`<br>`config-lag-if` | Administrators or local user group members with execution rights for this command. |

# dwrr queue

```
dwrr queue <QUEUE-NUMBER> [weight <WEIGHT>]
no dwrr queue <QUEUE-NUMBER>
```

### Description

Assigns the deficit weighted round robin (DWRR) algorithm and its weight to a queue in a schedule profile. DWRR allocates available bandwidth among all non-empty queues in relation to the queue weights.

Use **show qos schedule-profile <NAME>** to view the settings of a specific schedule profile.

The **no** form of this command removes the DWRR algorithm from a queue in a schedule profile.

| Parameter | Description |
|---|---|
| `<QUEUE-NUMBER>` | Specifies the queue number. Range: 0 to 7. |
| `weight <WEIGHT>` | Specifies the scheduling weight. Range: 1 to 1023. |

### Examples

Assigning DWRR with a weight of **17** to queue **2** in the schedule profile **MySchedule**:

```
switch(config)# qos schedule-profile MySchedule
switch(config-schedule)# dwrr queue 2 weight 17
```

Deleting DWRR for queue **2** from the schedule profile **MySchedule**:

```
switch(config)# qos schedule-profile MySchedule
switch(config-schedule)# no dwrr queue 2
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-schedule-<NAME>` | Administrators or local user group members with execution rights for this command. |

## map queue

`map queue <QUEUE-NUMBER> local-priority <PRIORITY-NUMBER>`

### Description

Assigns a local priority to a queue in a queue profile. By default, the larger the queue number the higher its priority. A queue without a local priority value assigned to it is not used to store packets. The same queue can be assigned multiple local priorities.

The **no** form of this command removes the specified local priority from a specific queue. If no local priority number is specified, then all local priorities are removed from the queue.

| Parameter | Description |
|---|---|
| *<QUEUE-NUMBER>* | Specifies the queue number. Range: 0 to 7. |
| *<PRIORITY-NUMBER>* | Specifies the local priority. Range: 0 to 7, where 0 is the lowest priority and 7 is the highest. |

### Usage

The following commands illustrate a valid configuration, where every local priority value is assigned to a queue:

```
map queue 0 local-priority 0
map queue 1 local-priority 1
map queue 1 local-priority 2
map queue 3 local-priority 3
map queue 4 local-priority 4
map queue 5 local-priority 5
map queue 5 local-priority 6
map queue 5 local-priority 7
```

The following commands illustrate an invalid configuration, because local priority 2 is not assigned to a queue:

```
map queue 0 local-priority 0
map queue 1 local-priority 1
map queue 2 local-priority 3
map queue 3 local-priority 4
map queue 4 local-priority 5
map queue 5 local-priority 6
map queue 5 local-priority 7
```

### Examples

Assigning priority **7** to queue **7** in profile **myprofile**:

```
switch(config)# qos queue-profile myprofile
switch(config-queue)# map queue 7 local-priority 7
```

Removing priority **7** from queue **7** in profile **myprofile**:

```
switch(config)# qos queue-profile myprofile
switch(config-queue)# no map queue 7 local-priority 7
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-queue` | Administrators or local user group members with execution rights for this command. |

## min-bandwidth

The min-bandwidth command only applies to Aruba 6200 and 6300 Series Switches.

```
min-bandwidth queue <QUEUE-NUMBER> percent <PERCENTAGE> [max-bandwidth <RATE>
{kbps|percent}]
no min-bandwidth queue <QUEUE-NUMBER> percent <PERCENTAGE> [max-bandwidth <RATE>
{kbps|percent}]
```

## Description

Assigns the Guaranteed Minimum Bandwidth (GMB) algorithm and a percentage of bandwidth to a queue. GMB allocates available bandwidth among all non-empty queues in relation to their configured minimum bandwidth. Non-empty queues are serviced first in strict order up to their minimum bandwidth. If there is any remaining bandwidth, the scheduler will strictly service any remaining non-empty queues.

Egress queue shaping can be configured using the **max-bandwidth** option to limit the amount of traffic transmitted per output queue at all times, even when there is leftover bandwidth available on the port. The buffer associated with each egress queue stores the excess traffic to smooth the output rate. Sustained rates of traffic above the maximum bandwidth will eventually fill the output queue, causing tail drops. Use **show interface <*IF-NAME*> queues** to determine if any tail-drop errors have occurred.

To remove only egress queue shaping, re-enter the **min-bandwidth queue** command without the **max-bandwidth** parameter.

The **no** form of this command only clears the algorithm for a queue if GMB has been assigned.

Occasionally, the following errors may occur:

- *The schedule profile total sum of GMB percentages must not exceed 100.*

This error occurs when attempting to apply a schedule profile with sum of GMB percentages of queues exceed 100 percentage. The solution is to configure GMB perecntage for queues, so that the sum of percentage must not exceed 100.

- *The max-bandwidth cannot be greater than 100 percent.*

This error occurs when a max-bandwidth value greater than 100 percent is configured on a queue.

- *The max-bandwidth cannot be less than <*NUM*> kbps.*

This error occurs when a kbps max-bandwidth value less than the supported minimum kbps shape value is configured on a queue. The supported minimum kbps shape value can be retrieved using the **show capacities** command.

| Parameter | Description |
|---|---|
| *<QUEUE-NUMBER>* | Specifies the queue number. Range: 0 to 7. |
| *<PERCENTAGE>* | Specifies bandwidth percentage used for GMB scheduling. Range: 0 to 100. |
| max-bandwidth *<RATE>* | Specifies the maximum bandwidth rate allowed on the queue in Kbps. Range: 64 to 100000000. Alternatively, the maximum bandwidth rate can be configured on the queue as a percentage of the port shape or link bandwidth if a port shape is not configured. The allowed range is 1-100. |

## Examples

Assigning queue **0** of schedule profile **S1** the GMB scheduling algorithm with minimum bandwidth of **5 percent**:

```
switch(config)# qos schedule-profile S1
switch(config-schedule)# min-bandwidth queue 0 percent 5
```

Removing GMB from queue 0:

```
switch(config)# qos schedule-profile s1
switch(config-schedule)# no min-bandwidth queue 0
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Added **max-bandwidth** parameter. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-schedule-<NAME>` | Administrators or local user group members with execution rights for this command. |

## name queue

```
name queue  <QUEUE-NUMBER> <DESCRIPTION>
no name queue  <QUEUE-NUMBER>
```

### Description

Assigns a description to a queue in a queue profile. This is for identification purposes and has no effect on configuration.

The **no** form of this command removes the description associated with a queue.

| Parameter | Description |
|---|---|
| *<QUEUE-NUMBER>* | Specifies the queue number. Range: 0 to 7. |
| *<DESCRIPTION>* | Specifies a queue description for identification purposes. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |

### Examples

Assigning the description **priority-traffic** to queue **7**:

```
switch(config)# qos queue-profile myprofile
switch(config-queue)# name queue 7 priority-traffic
```

Removing the description from queue **7**:

```
switch(config)# qos queue-profile myprofile
switch(config-queue)# no name queue 7
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-queue` | Administrators or local user group members with execution rights for this command. |

## qos cos

```
qos cos <CODE-POINT>
no qos cos
```

### Description

Configures a CoS PCP remark for an Ethernet or LAG interface. Packets that ingress on the interface are remarked at egress using the configured CoS PCP value.

The remark only occurs when QoS trust mode on the interface is set to **none**.

If QoS trust mode is not set to **none**, then the remark is ignored, and the following commands will show the CoS remark status as **ignored (incompatible Port Access Trust configuration**) or **not applied' (incompatible QoS global/port Trust configuration)**:

- show running-configuration
- show interface <*PORT-NUM*>
- show interface <*PORT-NUM*> qos

The **no** form of this command removes a CoS remark on an interface.

| Parameter | Description |
|---|---|
| *`<CODE-POINT>`* | Specifies an 802.1 VLAN priority CoS value. Range: 0 to 7. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring a CoS remark of **3** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# qos trust none
switch(config-if)# qos cos 3
```

Deleting a CoS remark of **3** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no qos cos
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## qos cos-map

`qos cos-map <CODE-POINT> local-priority <PRIORITY-NUMBER> [color <COLOR>] [name <DESCRIPTION>]`
`no qos cos-map <CODE-POINT>`

### Description

Defines the local priority assigned to incoming packets for a specific 802.1 VLAN priority code point (CoS) value. The CoS map values are used to mark incoming packets when QoS trust mode is set to **cos**. In **trust none** mode, CoS map entry 0 is used to set the port default local priority and color.

To see the default CoS map settings, use the following command:

```
switch# show qos cos-map default
code_point local_priority color   name
---------- -------------- ------- ----
0          1              green   Best_Effort
1          0              green   Background
2          2              green   Excellent_Effort
3          3              green   Critical_Applications
4          4              green   Video
5          5              green   Voice
6          6              green   Internetwork_Control
7          7              green   Network_Control
```

The **no** form of this command restores the assignments for a CoS map value to the default setting.

| Parameter | Description |
|---|---|
| *<CODE-POINT>* | Specifies an 802.1 VLAN priority CoS value. Range: 0 to 7. Default 0. |
| local-priority *<PRIORITY-NUMBER>* | Specifies a local priority value to associate with the CODE-POINT value. Range: 0 to 7. Default: 0. |
| color *<COLOR>* | Reserved for future use. |
| name *<DESCRIPTION>* | Specifies a description for the CoS setting. The name is for identification only, and has no effect on queue configuration. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |

## Usage

## Examples

Mapping CoS value **1** to a local priority of **2**:

```
switch(config)# qos cos-map 1 local-priority 2
```

Mapping CoS value **1** to the default local priority value:

```
switch(config)# no qos cos-map 1
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config | Administrators or local user group members with execution rights for this command. |

# qos dscp

qos dscp *<CODE-POINT>*
no qos dscp

## Description

Configures a differentiated services code point (DSCP) remark for an Ethernet or LAG interface. IPV4 and IPV6 packets that ingress on the interface are remarked at egress using the configured DSCP value.

The remark only occurs when QoS trust mode on the interface is set to **none**. If a DSCP remark is configured and then trust mode is subsequently set to **cos** or **dscp**, then the DSCP remark is ignored.

The following commands will show the remark status as *ignored* (incompatible Port Access Trust configuration) or *not applied* (incompatible QoS global or port trust configuration):

- **show running-configuration**
- **show interface <INTERFACE-NAME>**
- **show interface <INTERFACE-NAME> qos**

The **no** form of this command removes a CoS remark on an interface.

| Parameter | Description |
|---|---|
| *<CODE-POINT>* | Specifies an IP differentiated services code point value. Range: 0 to 63. |

## Usage

Order of operation for arriving IPv4 or IPv6 packets:

1. Trust none is applied with initial local-priority and color metadata assigned from the CoS Map entry index 0.
2. The local-priority value and the queue profile are then used to determine the queue for the packet.
3. The remark of the packet's DSCP metadata field is performed. When the packet is transmitted, its IPv4 or IPv6 DS header is remarked with the DSCP metadata.

For arriving non-IP packets:

Trust none is applied with initial local-priority and color metadata assigned from the CoS Map entry index 0. This selects the queue for packet scheduling. The PCP of any tagged non-IP packets is unchanged.

## Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring a DSCP remark of **43** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# qos trust none
switch(config-if)# qos dscp 43
```

Deleting a DSCP remark of **43** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no dscp 43
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if`<br>`config-lag-if` | Administrators or local user group members with execution rights for this command. |

## qos dscp-map

```
qos dscp-map <CODE-POINT> local-priority <PRIORITY-NUMBER> [color <COLOR>] [cos <PCP-
VALUE>] [name <DESCRIPTION>]
no qos dscp-map <CODE-POINT>
```

### Description

Defines the local priority color assigned to incoming packets for a specific IP differentiated services code point (DSCP) value. The DSCP map values are used to prioritize incoming packets when QoS trust mode is set to **dscp**.

The **no** form of this command restores the assignments for a code point to the default setting.

Use **show qos dscp-map** to view the current settings. To see the default DSCP map settings, use the following command:

```
switch# show qos dscp-map default
code_point local_priority cos color    name
---------- -------------- --- -------- ----
0          1                  green    CS0
1          1                  green
2          1                  green
3          1                  green
4          1                  green
5          1                  green
...
45         5                  green
46         5                  green    EF
47         5                  green
48         6                  green    CS6
...
61         7                  green
62         7                  green
63         7                  green
```

| Parameter | Description |
|---|---|
| *<CODE-POINT>* | Specifies an IP differentiated services code point. Range: 0 to 63. Default: 0. |
| `local-priority` *<PRIORITY-NUMBER>* | Specifies a local priority value to associate with the **CODE-POINT** value. Range: 0 to 7. Default: 0. |

| Parameter | Description |
|---|---|
| `color <COLOR>` | Configures the QoS CoS map color. The supported colors are green, red, and yellow. The default color is green. |
| `cos <PCP-VALUE>` | Specifies an optional 802.1p VLAN Priority Code Point remark value. Range: 0 to 7. Default: No remark. |
| `name <DESCRIPTION>` | Specifies a description for the DSCP setting. The name is used for identification only, and has no effect on queue configuration. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |

### Examples

Setting code point **1** to a local priority of **2** and a CoS of **0**:

```
switch(config)# qos dscp-map 1 local-priority 2 cos 0
```

Setting code point **1** to the default value:

```
switch(config)# no qos dscp-map 1
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Added *<COLOR>* parameters. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# qos queue-profile

```
qos queue-profile <NAME>
no qos queue-profile <NAME>
```

### Description

Creates a new QoS queue profile and switches to the **config-queue** context for the profile. Or, if the specified QoS queue profile exists, this command switches to the **config-queue** context for the profile.

A queue profile maps queues to local-priority values.  Each profile has one to eight queues numbered 0 to 7. The larger the queue number, the higher its priority during transmission scheduling.

The **no** form of this command removes the specified QoS queue profile. Only profiles that are not currently applied can be removed.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies the name of the QoS queue profile to create or configure. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |

### Examples

Creating the profile **myprofile**:

```
switch(config)# qos queue-profile myprofile
switch(config-queue)#
```

Deleting the profile **myprofile**:

```
switch(config)# no qos queue-profile myprofile
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## qos schedule-profile

```
qos schedule-profile <NAME>
no qos schedule-profile <NAME>
```

### Description

Creates a QoS schedule profile and switches to the **config-schedule** context for the profile. If the specified schedule profile exists, this command switches to the **config-schedule** context for the profile. The schedule profile determines the order in which queues are selected to transmit a packet, and the amount of service defined for each queue.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies the name of the QoS queue profile to create or configure. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |

## Usage

Queues in a schedule profile are numbered consecutively starting from zero. Queue zero is the lowest priority queue. The larger the queue number, the higher priority the queue has in scheduling algorithms.

A profile named **factory-default** is defined by default and applied to all interfaces. It cannot be edited or deleted. To see its settings, use the command:

```
switch# show qos schedule-profile factory-default
queue_num algorithm weight
--------- --------- ------
0         dwrr      1
1         dwrr      1
2         dwrr      1
3         dwrr      1
4         dwrr      1
5         dwrr      1
6         dwrr      1
7         dwrr      1
```

A profile named **strict** is predefined and cannot be edited or deleted. The strict profile services all queues of the queue profile to which it is applied, using the strict priority algorithm.

A schedule profile must be defined on all interfaces at all times.

There are two permitted configurations for a schedule profile:

1. All queues use the same scheduling algorithm (for example, DWRR).
2. The highest queue number uses strict priority, and all remaining (lower) queues use the same algorithm (for example, DWRR). This supports priority scheduling behavior necessary for the IETF RFC 3246 Expedited Forwarding specification (https://tools.ietf.org/html/rfc3246).

Only limited changes can be made to an applied schedule profile:

- The weight of a dwrr queue.
- The bandwidth of a strict queue or a min-bandwidth queue.
- The algorithm of the highest numbered queue can be swapped between dwrr and strict, and vice versa.

Applicable to REST: Any other changes will result in an unusable schedule profile, and the switch will revert to the **factory-default** profile until the profile is corrected.

The **no** form of this command removes the specified QoS schedule profile when it is not applied. Only profiles that are not currently applied to an interface can be removed.

## Examples

Creating the schedule profile **MySchedule**:

```
switch(config)# qos schedule-profile MySchedule
switch(config-schedule)#
```

Deleting the schedule profile **MySchedule**:

```
switch(config)# no qos schedule-profile MySchedule
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## qos shape

```
qos shape <RATE> [kbps|percent]
no qos shape
```

### Description

Limits the egress bandwidth on an interface to a value that is lower than its line rate.

Errors will be generated in the following events:

- A user configures a port-shaping value that is greater than 100 percent
- A user configures a kbps port-shaping value that is less than the supported minimum kbps value. The supported minimum kbps shaping value can be retrieved using the **show capacities** command.

The **no** form of this command removes shaping from an interface.

| Parameter | Description |
|---|---|
| *<RATE>* | Specifies the maximum traffic rate in kbps. Range: 1 to 100000000. Alternatively, the bandwidth can also be configured as a percentage of link bandwidth. The supported range is 1-100. Default units are kilobits per second. |

### Usage

When the traffic rate destined for the port exceeds the configured egress bandwidth, the switch will buffer the excess up to the limit of the queues. Rates larger than the interface's link rate will have no effect. When set on a LAG, each member Ethernet port independently shapes its egress bandwidth to the specified rate.

### Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring an egress port shaping rate of 400 Mbps on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# qos shape 400000 kbps
```

Configuring an egress port-shaping rate of 40% on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# qos shape 40 percent
```

Deleting egress port shaping on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no qos shape
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Added optional **kbps** and **percent** parameters. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## qos trust

```
qos trust {none|cos|dscp}
no qos trust
```

### Description

In the **config** context:

- This command sets the trust mode that is globally applied to all interfaces that do not have a trust mode configured.

- The **no** form of this command restores all interfaces that do not currently have a trust mode configured to the default setting.

In the **config-if** context:

- This command sets the trust mode override for a specific interface.
- The **no** form of this command clears a trust mode override. The interface then uses the global setting. This is the only way to remove a trust mode override.

| Parameter | Description |
|---|---|
| `none` | Ignores all packet headers. Ingress packets are assigned the local priority and color values configured for CoS map entry 0. Default. |
| `cos` | For 802.1 VLAN tagged packets, use the priority code point field from the outermost VLAN header as the index into the CoS map to obtain the local priority and color values for the packet. If the packet is untagged, use the local priority and color values configured for CoS map entry 0. |
| `dscp` | For IP packets, use the DSCP field from the IP header as the index into the DSCP Map. For non-IP packets with 802.1 VLAN tags, use the priority code point field from the outermost VLAN header as the index into the CoS map to obtain the local priority and color values for the packet. For untagged, non-IP packets, use the local priority and color values configured for CoS map entry 0. |

## Example

Setting the global trust mode to **dscp**, which is applied to all interfaces that do not already have an individual trust mode configured. An override is then applied to interface **2/2/2**, and LAG 100, setting trust mode to **cos**:

```
switch(config)# qos trust dscp
switch(config)# interface 2/2/2
switch(config-if)# qos trust cos
switch(config-if)# interface lag 100
switch(config-if)# qos trust cos
```

**WARNING:** QoS port remark configurations are not applied when the QoS trust mode is *mode*. This warning message is seen if a port trust command other than *trust none* is attempted when there is already a remark configuration on the port. To restore the old remark configuration, configure the port trust mode to *none*.

**WARNING:** QoS port remark configurations are not applied when the global QoS trust mode is *mode*. This warning message is seen if a port *no qos trust* command is attempted when there is already a remark configuration on the port and the global trust mode is not *none*. To re-apply the remark configuration, set the port trust mode to *none*.

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config`<br>`config-if`<br>`config-lag-if` | Administrators or local user group members with execution rights for this command. |

## queue action

### WRED

#### 6200, 6300, 6400v1 Switch Series

```
queue <0-7> action wred-resp { green | yellow | red } min-threshold <WRED-MIN-LIMIT>
percent max-threshold <WRED-MAX-LIMIT> percent
queue <0-7> action wred-non-resp { green | yellow | red } min-threshold <WRED-MIN-LIMIT>
percent max-threshold <WRED-MAX-LIMIT> percent
```

#### 6400v2 Switch Series

```
queue <0-7> action wred-resp { green | yellow | red } min-threshold <WRED-MIN-LIMIT>
percent max-threshold <WRED-MAX-LIMIT> percent max-prob <WRED-MAX-PROB> percent
queue <0-7> action wred-non-resp { green | yellow | red } min-threshold <WRED-MIN-LIMIT>
percent max-threshold <WRED-MAX-LIMIT> percent max-prob <WRED-MAX-PROB> percent
```

### Description

Defines the threshold settings and action for a specified queue in a threshold-profile. For ECN, when queue utilization exceeds the threshold value, ECT (ECN-Capable Transport) packets will be CE (Congestion Encountered) marked when transmitted.

For WRED, when queue utilization exceeds the threshold value, WRED action will randomly early-drop packets to signal congestion. More than one WRED action can be configured on a single queue for different packet colors.

The **no** form of this command removes the settings for a queue.

| Parameter | Description |
|---|---|
| *<0-7>* | Specifies the queue number. Range: 0 to 7. |
| *<WRED-MIN-LIMIT>* | Specifies the queue minimum utilization threshold value for WRED to probabilistically start dropping packets. |
| *<WRED-MAX-LIMIT>* | Specifies the queue maximum utilization threshold value for |

| Parameter | Description |
|---|---|
| | WRED, after which every packet is dropped. |
| *<WRED-MAX-PROB>* | Specifies the maximum WRED probability of dropping a packet for the specified queue.<br>**NOTE:** Applicable only on the 6400v2, 8100, 8360v2, 8320, 8325, 8400, 9300, and 10000 Switch Series. |

## Examples

Configuring a responsive WRED action on queue 2 for red-, yellow-, and green-colored packets:

*Applicable only on the 6200, 6300, and 6400v1 Switch Series*

```
switch(config)# qos threshold-profile threshprofile
switch(config-threshold)# queue 2 action wred-resp green min-threshold 70 percent
max-threshold 100 percent
switch(config-threshold)# queue 2 action wred-resp yellow min-threshold 60 percent
max-threshold 95 percent
switch(config-threshold)# queue 2 action wred-resp red min-threshold 50 percent
max-threshold 80 percent
```

*Applicable only on the 6400v2 Switch Series*

```
switch(config)# qos threshold-profile threshprofile
switch(config-threshold)# queue 2 action wred-resp green min-threshold 70 percent
max-threshold 100 percent max-prob 70 percent
switch(config-threshold)# queue 2 action wred-resp yellow min-threshold 60 percent
max-threshold 95 percent max-prob 85 percent
switch(config-threshold)# queue 2 action wred-resp red min-threshold 50 percent
max-threshold 80 percent max-prob 90 percent
```

Configuring a non-responsive WRED action on queue 4 for red-, yellow-, and green-colored packets:

*Applicable only on the 6200, 6300, and 6400v1 Switch Series*

```
switch(config)# qos threshold-profile threshprofile
switch(config-threshold)# queue 4 action wred-non-resp green min-threshold 70
percent max-threshold 100 percent
switch(config-threshold)# queue 4 action wred-non-resp yellow min-threshold 65
percent max-threshold 95 percent
switch(config-threshold)# queue 4 action wred-non-resp red min-threshold 50
percent max-threshold 80 percent
```

*Applicable only on the 6400v2 Switch Series*

```
switch(config)# qos threshold-profile threshprofile
switch(config-threshold)# queue 4 action wred-non-resp green min-threshold 70
percent max-threshold 100 percent max-prob 71 percent
switch(config-threshold)# queue 4 action wred-non-resp yellow min-threshold 65
percent max-threshold 95 percent max-prob 82 percent
switch(config-threshold)# queue 4 action wred-non-resp red min-threshold 50
percent max-threshold 80 percent max-prob 95 percent
```

Removing a threshold from queue **7** in profile **mythreshold**:

```
switch(config)# qos threshold-profile mythreshold
switch(config-threshold)# no queue 7
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-threshold` | Administrators or local user group members with execution rights for this command. |

## rate-limit

```
rate-limit {broadcast|multicast|unknown-unicast|icmp {ip-all|ip|ipv6}} <RATE>
{kbps|percent|pps}
no rate-limit {broadcast|multicast|icmp}
```

### Description

Sets the amount of traffic of a specific type that can ingress on an Ethernet interface, or on each port of a LAG interface. Rate limits are enforced separately on each individual member of a LAG, not on the LAG as a whole.

The **no** form of this command removes the traffic limit for the specified traffic type.

| Parameter | Description |
|---|---|
| `{broadcast|multicast|unknown-unicast|icmp {ip-all|ip|ipv6}` | Specifies the type of ingress traffic to which the rate limit applies: broadcast, multicast, unknown-unicast, or ICMP.<br>The multicast rate limit affects multicast and broadcast traffic. The broadcast rate limit only affects broadcast traffic. When both types are applied to the same interface, broadcast packets are limited to the lower of the two rate values. Layer 2 BPDU packets, like spanning tree, are also included in the multicast rate limit.<br>The ICMP rate limit can be configured to apply to IPv4, IPv6, or all IP traffic. Only one |

| Parameter | Description |
|---|---|
| | ICMP rate-limit can be configured at a time. Applying a new ICMP rate-limit replaces any previous ICMP rate-limit. |
| `<RATE> {kbps|percent|pps}` | Specifies the rate limit in kilobits per second, packets per second, or as a percentage of link bandwidth. Range: 64 to 100000000 kbps (in steps of 64 kbps), 64 to 209090910 pps (in steps of 64 pps), or 1-100 percent. The actual rate limit will be approximately equivalent to the minimum of the two step values that are closest to the configured rate (or for percent mode, the kbps-converted rate). The actual applied rate limit can be verified using the **show interface <IF-NAME> qos** command.<br>For percentage mode, rate-limits may be shown as "not applied" until after link-up has occurred on the configured port or LAG. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Limiting broadcast traffic to **2000pps** on interface **1/1/3**:

```
switch(config)# interface 1/1/3
switch(config-if)# rate-limit broadcast 500 kbps
```

Limiting all ICMP IPv4 traffic to **10000kbps** on interface **1/1/3**:

```
switch(config)# interface 1/1/3
switch(config-if)# rate-limit icmp ip 10000 kbps
```

Viewing the results of the previous configuration settings:

```
switch# show interface 1/1/3 qos
 Interface 1/1/3 is up
 Admin state is up
 Description:
 Hardware: Ethernet, MAC Address: 08:97:34:b1:20:00
 MTU 1500
 Type 1000BT
 qos trust none
 rate-limit broadcast 2000 pps (2000 actual)
 rate-limit icmp ip-all 10000 kbps (10000 actual)
 Speed 1000 Mb/s
```

```
L3 Counters: Rx Disabled, Tx Disabled
Auto-Negotiation is on
Flow-control: off
Rx
           0 input packets               0 bytes
           0 input error                 0 dropped
           0 CRC/FCS
      L3:
           0 packets, 0 bytes
Tx
         127 output packets          16510 bytes
           0 input error                 0 dropped
           0 collision
      L3:
           0 packets, 0 bytes
```

Configuring a multicast rate-limit as a percentage of link bandwidth:

```
switch(config)# interface 1/1/3
switch(config-if)# rate-limit multicast 1 percent
```

Configuring an unknown-unicast rate-limit in packets per second:

```
switch(config)# interface 1/1/4
switch(config-if)# rate-limit unknown-unicast 100 pps
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated. |
| 10.13 | Added the **percent** parameter. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## show interface queues

`show interface <INTERFACE-NAME> queues`

### Description

Displays interface-level queue statistics.

| Parameter | Description |
|---|---|
| *<INTERFACE-NAME>* | Specifies the name of an Ethernet port or LAG on the switch. Format: **member/slot/port** or **lag number**. |

## Usage

Statistics include:

- **Tx Bytes**: Total bytes transmitted. The byte count may include packet headers and internal metadata that are removed before the packet is transmitted. Packet headers added when the packet is transmitted may not be included. The byte count includes any packets subsequently dropped by an egress ACL (6300 Series Switch only).
- **Tx Packets:** Total packets transmitted. The count includes packets subsequently dropped by an egress ACL (6300 Series Switch only).
- **Tx Drops:**For the 6300 Series Switch total packets dropped by an egress queue due to insufficient capacity. For the 6400 Series Switch sum of packets that were dropped across all line modules by Virtual Output Queues (VOQs) destined for the egress port queue due to insufficient capacity. As the counts are read separately from each line module, the sum is not an instantaneous snapshot.

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing queue statistics for interface **1/1/5**:

```
switch# show interface 1/1/5 queues
Interface 1/1/5 is down
Admin state is up
                Tx Bytes      Tx Packets        Tx Drops
Q0                     0               0               3
Q1                 15356              73               0
Q2                     0               0               0
Q3                     0               0               0
Q4                     0               0               0
Q5                     0               0               0
Q6                     0               0               0
Q7                     0               0               0
```

Showing queue statistics for interface **lag 1**:

```
switch# show interface lag 1 queues
Aggregate-name lag1
Aggregated-interfaces :
1/1/6  1/1/7
Speed 20000 Mb/s
                Tx Bytes      Tx Packets        Tx Drops
Q0                     0               0               0
Q1                     0               0               0
Q2                     0               0               0
Q3                     0               0               0
Q4                     0               0               0
Q5                     0               0               0
Q6                     0               0               0
```

```
Q7                  3450              25               0
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show interface qos

`show interface <INTERFACE-NAME> qos`

### Description

Shows various QoS settings for a specific interface.

| Parameter | Description |
|---|---|
| *<INTERFACE-NAME>* | Specifies the name of an interface on the switch. Format: **member/slot/port** or **lag number**. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Showing QoS settings for interface **1/1/5**:

```
switch# show interface 1/1/5 qos
Interface 1/1/5 is up
 Admin state is up
 qos trust none (global)
 qos queue-profile factory-default (global)
 qos schedule-profile factory-default (global)
 qos cos 5
 qos dscp 47
 rate-limit broadcast 4 percent (40000 actual)
 rate-limit icmp ip-all 10000 kbps (10000 actual)
                          Forwarded Pkts         Dropped Pkts      Forwarded Bytes
       Dropped Bytes
   Broadcast:                     944468                 1044           1044658890
            85662408
   ICMP:                           82210                    0              2689008
                   0
 qos shape 200000 kbps (199999 kbps actual)
```

Showing QoS settings for a two-member lag:

```
switch# **show interface lag1 qos**
Aggregate-name lag1
 Admin state is up
 qos trust cos (global)
 qos queue-profile factory-default (global)
 qos schedule-profile test (override)
 qos cos 5
 qos dscp 47
 rate-limit broadcast 4 percent (40000 actual)
 rate-limit icmp ip-all 10000 kbps (10000 actual)
                          Forwarded Pkts         Dropped Pkts      Forwarded Bytes
       Dropped Bytes
   Broadcast:                     944468                 1044           1044658890
            85662408
   ICMP:                           82210                    0              2689008
                   0
 qos shape 200000 kbps (199999 kbps actual per interface, 399998 kbps total for
LAG)

Per Interface Status

                Maximum  Bandwidh
 Queue        Bandwidth  Units
 --------------------------------
 Q1               20000  kbps
 Q4               30000  kbps
 Q7               40000  kbps
```

Showing QoS settings for the VSF interface 1/1/49:

The following example applies only to the 6300 Switch Series.

```
switch# **show interface 1/1/49 qos**
Interface 1/1/49 is up
 Admin state is up
 qos trust none (global)
 qos queue-profile factory-default (global)
 qos schedule-profile factory-default (global)
 qos shape 10000000 kbps (10000000 kbps actual)
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.13.1000 | Command updated to display qos shape <*SPEED*>. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show qos cos-map

```
show qos cos-map [default] [vsx-peer]
```

NOTE: The **vsx-peer** parameter is not supported by the 6300 Series Switch

### Description

Shows the global QoS CoS code point settings, or the factory default settings.

| Parameter | Description |
|---|---|
| `default` | Shows the factory default CoS code point settings. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing the current CoS map:

```
switch# show qos cos-map
code_point local_priority color   name
---------- -------------- ------- ----
0          2              green   Best_Effort
1          0              green   Background
2          1              green   Spare
3          3              green   Excellent_Effort
4          4              green   Controlled_Load
5          5              green   Video
6          6              green   Voice
7          7              green   Network_Control
```

Showing the default CoS map:

```
switch# show qos cos-map default
code_point local_priority color   name
```

```
---------- -------------- ------- ----
0          1              green   Best_Effort
1          0              green   Background
2          2              green   Excellent_Effort
3          3              green   Critical_Applications
4          4              green   Video
5          5              green   Voice
6          6              green   Internetwork_Control
7          7              green   Network_Control
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show qos dscp-map

```
show qos dscp-map [default] [vsx-peer]
```

NOTE: The **vsx-peer** parameter is not supported by the 6300 Series Switch

### Description

Displays the current or default global QoS dscp-map.

| Parameter | Description |
|---|---|
| `default` | Shows the factory default DSCP code point settings. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing the current QoS DSCP map:

```
switch# show qos dscp-map
code_point local_priority cos color   name
---------- -------------- --- ------- ----
0          1                  green   CS0
1          1                  green
2          1               3  green
3          1                  green
4          1                  green
5          1                  green
6          1                  green
7          1                  green
8          0                  green   CS1
...
45         5                  green
46         7                  green   EF
47         5               7  green
48         6                  green   CS6
...
61         7                  green
62         7                  green
63         7                  green
```

Showing the default QoS DSCP map:

```
switch# show qos dscp-map default
code_point local_priority cos color   name
---------- -------------- --- ------- ----
0          1                  green   CS0
1          1                  green
2          1                  green
3          1                  green
4          1                  green
5          1                  green
...
45         5                  green
46         5                  green   EF
47         5                  green
48         6                  green   CS6
...
61         7                  green
62         7                  green
63         7                  green
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show qos queue-profile

```
show qos queue-profile [<NAME> | factory-default] [vsx-peer]
```

**NOTE:** The **vsx-peer** parameter is not supported by the 6300 Series Switch

### Description

Shows the status of all queue profiles, or a specific queue profile.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies the name of a queue profile. Range 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |
| `[factory-default]` | Specifies the factory default queue profile. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

The status of a queue profile can be:

- Applied - The profile is actively being used by the switch.
- Complete - The profile meets the criteria to be applied.
- Incomplete - The profile does not meet the criteria to be applied.

For a queue profile to be complete and ready to be applied:

- All eight local priorities must be mapped to some queue.
- There can be 1 to 8 queues.
- The queues must be consecutively numbered starting at zero.

### Examples

Showing the settings of the factory default queue profile:

```
switch# show qos queue-profile factory-default
queue_num local_priorities name
--------- ---------------- ----
0         0
1         1
2         2
3         3
```

```
4           4
5           5
6           6
7           7
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show qos schedule-profile

```
show qos schedule-profile [<NAME> | factory-default | strict] [vsx-peer]
```

NOTE: The **vsx-peer** parameter is not supported by the 6300 Series Switch

### Description

Shows the status of all schedule profiles, or a specific schedule profile.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies the name of a queue or schedule profile. Range: 1 to 64 alphanumeric characters, including period (.), underscore (_), and hyphen (-). |
| `[factory-default]` | Specifies the factory default queue profile. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

The status of a schedule profile can be:

- Applied - The profile is actively being used by one or more ports.
- Complete - The profile meets the criteria to be applied.
- Incomplete - The profile does not meet the criteria to be applied.

For a schedule profile to be complete and ready to be applied it must have:

- An algorithm for each queue defined by the applied queue profile.
- All queues must use the same algorithm except for the highest numbered queue, which may be strict.

### Example

Showing the status of all schedule profiles:

```
switch# show qos schedule-profile
profile_status profile_name
-------------- ------------
applied        MySchedule
complete       factory-default
complete       Test
```

Showing the configuration of factory default schedule profile:

```
switch# show qos schedule-profile factory-default
Queue
Number  Algorithm      Weight
------- -------------- --------
0       dwrr           1
1       dwrr           1
2       dwrr           1
3       dwrr           1
4       dwrr           1
5       dwrr           1
6       dwrr           1
7       dwrr           1
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show qos trust

```
show qos trust [default] [vsx-peer]
```

**NOTE:** The **vsx-peer** parameter is not supported by the 6300 Series Switch

## Description

Shows the global QoS trust settings, or the factory default settings.

| Parameter | Description |
|---|---|
| `default` | Shows the factory default QoS trust settings. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Showing the current QoS trust settings:

```
switch# show qos trust
qos trust cos
```

Showing the default QoS trust settings:

```
switch# show qos trust default
qos trust none
```

For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# strict queue

```
strict queue <0-7> [max-bandwidth <RATE> [kbps|percent]
no strict queue <0-7> [max-bandwidth <RATE> [kbps|percent]
```

## Description

Assigns the strict priority algorithm to a queue. Strict priority services all packets waiting in a queue, before servicing the packets in lower priority queues.

Egress queue shaping can be configured using the **max-bandwidth** option to limit the amount of traffic transmitted per output queue. The buffer associated with each egress queue stores the excess traffic to smooth the output rate. Sustained rates of traffic above the maximum bandwidth will eventually fill the output queue, causing tail drops. Use **show interface <IF-NAME> queues** to determine if any tail-drop errors have occurred.

The **no** form of this command removes the queue configuration from the schedule profile. To remove only egress queue shaping, re-enter the strict queue command without the **max-bandwidth** parameter.

| Parameter | Description |
|---|---|
| `<QUEUE-NUMBER>` | Specifies the number of the queue. Range: 0 to 7. |
| `max-bandwidth <BANDWIDTH>` | Specifies the maximum bandwidth allowed on the queue in Kbps. Range: 64 to 100000000. Alternatively, the maximum bandwidth rate can also be configured on the queue as a percentage of the port shape or link bandwidth if a port shape is not configured. The allowed range is 1-100. |

## Usage

Either all the queues of the schedule profile can be *strict* or just the highest numbered queue. When applied to a LAG, each member Ethernet port independently schedules its egress transmissions using the strict settings. Only limited changes can be made to a *strict* queue that is part of an applied schedule profile:

- The max-bandwidth settings.
- The highest numbered queue can be swapped between *strict* and *dwrr*` or *min-bandwidth* (only applicable for the Aruba 6300 Series Switch)
- The highest numbered queue can be swapped between *strict* and *dwrr* (only applicable for the Aruba 6400 Series Switch)

Any other changes or removing a queue (**no strict queue**) will result in an unusable schedule profile. If that schedule profile is applied in the interface context, the switch will revert to the schedule profile applied in the global context until the profile is corrected. If that schedule profile is applied in the global context, the switch will revert to using the factory-default profile until the profile is corrected.

It is possible for the following errors to occur:

- **The max-bandwidth cannot be greater than 100 percent.**

This error occurs when a max-bandwidth value greater than 100 percent is configured on a queue.

- **The max-bandwidth cannot be less than <*NUM*> kbps.**

This error occurs when a kbps max-bandwidth value less than the supported minimum kbps shape value is configured on a queue. The supported minimum kbps shape value can be retrieved using the **show capacities** command.

## Examples

Assigning strict priority to queue **7** in the schedule profile **MySchedule**:

```
switch(config)# qos schedule-profile MySchedule
switch(config-schedule)# strict queue 7
```

Deleting strict priority from queue **7** in the schedule profile **MySchedule**:

```
switch(config)# qos schedule-profile MySchedule
switch(config-schedule)# no strict queue 7
```

Assigning strict priority to queue **7** in the schedule profile **MySchedule** with a maximum bandwidth of 10000 Kbps:

```
switch(config)# qos schedule-profile MySchedule
switch(config-schedule)# strict queue 7 max-bandwidth 10000 kbps
```

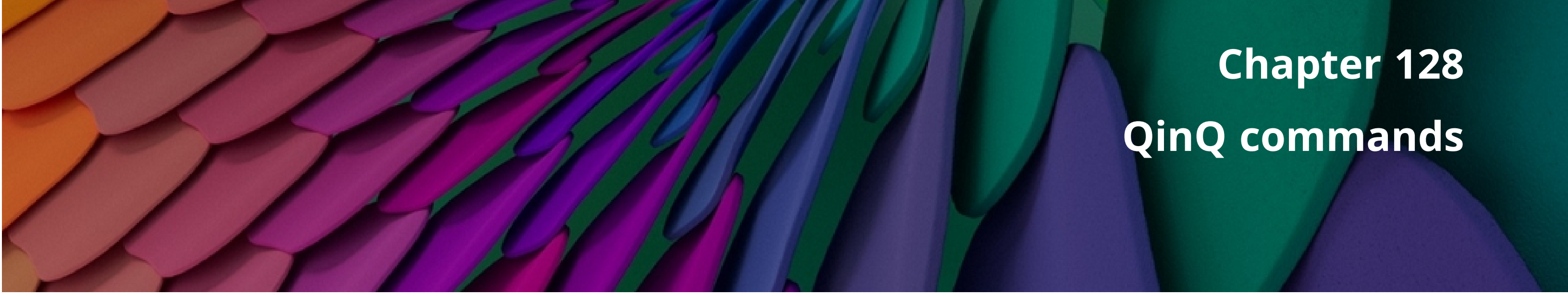
For more information on features that use this command, refer to the Quality of Service Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.13 | Added the **kbps** and **percent** parameters. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-schedule-<NAME>` | Administrators or local user group members with execution rights for this command. |



# Chapter 128

# QinQ commands

## debug vlan qinq

`debug vlan qinq severity`

### Description

Enables the VLAN debug logs to trace the QinQ changes and filtering with minimum log severity.

### Examples

Enabling the debug logs for QinQ

```
switch# debug vlan qinq
severity        Minimum log severity to filter debug logs
<cr>
switch# debug vlan qinq severity
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## diag-dump l2vlan basic

`diag-dump l2vlan basic`

### Description

Collects the debug information in the case of any issue in the QinQ daemon. Diagnostic for QinQ is part of VLAN daemon.

### Examples

Configuring diagnostic dump for QinQ

```
switch# diag-dump l2vlan basic
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show qinq

```
show qinq
```

### Description

Shows the configuration details of QinQ.

### Examples

Showing the QinQ configuration

```
switch# show qinq
QinQ Configuration Information

Encapsulation Ethertype: 0x88A8

SVLAN List: 100-103

-------------------------------------------------------
Port       Type                          VLAN Membership
-------------------------------------------------------
1/1/1      customer-network (access)   100
1/1/3      provider-network (trunk)    100-103
1/1/5      customer-network (access)   101
1/1/7      customer-network (access)   102
1/1/9      customer-network (access)   103
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show running-config qinq

`show running-config qinq`

### Description

Shows all the QinQ configurations in the switch.

### Examples

Showing the QinQ running configuration

~~~
switch# show running-config qinq
Current configuration:
...
vlan 300
    svlan

```
~~~

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show tech qinq

```
show tech qinq
```

## Description

Shows the tech support for QinQ feature.

## Examples

Showing the tech support for QinQ feature

```
switch# show tech qinq
====================================================
Show Tech executed on Thu Mar 17 03:07:03 2022
====================================================
====================================================
[Begin] Feature qinq
====================================================

*********************************
Command : show running-config qinq
*********************************
vlan 300
    svlan

*********************************
Command : show qinq
*********************************

switch# show qinq

QinQ Configuration Information

Encapsulation Ethertype: 0x88A8

SVLAN List: 100-103
---------------------------------------------------
Port       Type                       VLAN Membership
---------------------------------------------------
1/1/1      customer-network (access)  100
1/1/3      provider-network (trunk)   100-103
1/1/5      customer-network (access)  101
1/1/7      customer-network (access)  102
1/1/9      customer-network (access)  103
====================================================
[End] Feature qinq
====================================================

====================================================
Show Tech commands executed successfully
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## svlan

```
svlan
no svlan
```

### Description

Configures a VLAN as a service VLAN. A port will implicitly become customer-network port, when it is an access member (untagged) of SVLAN. A port will implicitly become provider-network port, when it is a trunk member (tagged) of SVLAN.

The **no** form of this command removes the service VLAN configuration.

A QinQ CN or PN port, which was a member of the SVLAN, will become normal VLAN port after removing service VLAN configuration from VLAN.

### Usage

- VLAN 1 cannot be configured as an SVLAN.
- An L2 port can be a member of either service VLANs or normal VLANs but cannot be used on both the VLANs.
- An L2 port with **vlan trunk allowed all** will not include service VLANs.
- Native VLAN configuration will be non-operational on PN port.

### Examples

Configuring VLAN 300 and enabling service VLAN mode

```
switch(config)# vlan 300
switch(config-vlan-300)# svlan
```

Removing the service VLAN mode configuration from VLAN 300

```
switch(config)# vlan 100
switch(config-vlan-100)# no svlan
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vlan-<VLAN-ID>` | Administrators or local user group members with execution rights for this command. |

# Chapter 129

# Configurable RADIUS attribute commands

## aaa radius-attribute group

```
aaa radius-attribute group <GROUP-NAME>
no aaa radius-attribute group <GROUP-NAME>
```

### Description

Configures an existing RADIUS server group for which the configured RADIUS attributes will be included in request packets. Enters the **config-radius-attr** context.

The **no** form of this command unconfigures the RADIUS server group for the configured RADIUS attributes.

Nas-id and tunnel-private-group-id attributes only apply to port access requests. Nas-ip-addr attributes only apply to management user requests.

| Parameter | Description |
|---|---|
| *<GROUP-NAME>* | Specifies an existing RADIUS server group name. |

### Examples

Configuring port access request RADIUS attributes for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# nas-id value ARUBA_NAS-01
switch(config-radius-attr)# nas-id request-type authentication
switch(config-radius-attr)# tunnel-private-group-id value static
switch(config-radius-attr)# tunnel-private-group-id request-type authentication
```

Configuring management user request RADIUS attributes for **rad_group2**:

```
switch(config)# aaa radius-attribute group rad_group2
switch(config-radius-attr)# nas-ip-addr request-type authentication
switch(config-radius-attr)# nas-ip-addr service-type user-management
```

Unconfiguring RADIUS attributes for **rad_group1**:

```
switch(config)# no aaa radius-attribute group rad_group1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## nas-id request-type

```
nas-id request-type {authentication | accounting | both}
no nas-id request-type {authentication | accounting | both}
```

### Description

For the selected (by context) RADIUS server group, configures the Network Access Server (NAS) ID request type for which the attribute configured with command **nas-id value** will be included.

The no form of this command unconfigures the specified request type.

Nas-id attributes only apply to port access requests.

| Parameter | Description |
|---|---|
| `authentication` | Selects the authentication request type. |
| `accounting` | Selects the accounting request type. |
| `both` | Selects both the authentication and accounting request types. |

### Examples

Configuring the authentication request type for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# nas-id request-type authentication
```

Configuring both the authentication and accounting request types for **rad_group2**:

```
switch(config)# aaa radius-attribute group rad_group2
switch(config-radius-attr)# nas-id request-type both
```

Unconfiguring the authentication request type for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# no nas-id request-type authentication
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-radius-attr` | Administrators or local user group members with execution rights for this command. |

## nas-id value

```
nas-id value <NAS-ID>
no nas-id [value <NAS-ID>]
```

### Description

For the selected (by context) RADIUS server group, configures the Network Access Server Identifier (NAS ID) (type 32, RFC 2865). The NAS ID is sent in the RADIUS access request and accounting packets to notify the source of the RADIUS access request.

The **no** form of this command unconfigures the specified NAS ID.

Nas-id attributes only apply to port access requests.

| Parameter | Description |
|---|---|
| *<NAS-ID>* | Specifies the FQDN or other unique identifying name of the Network Access Server (NAS). Range 1 to 253 characters. |

### Examples

Configuring the Network Access Server (NAS) ID for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# nas-id value ARUBA_NAS-01
```

Unconfiguring the NAS ID for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# no nas-id value ARUBA_NAS-01
```

Unconfiguring both the NAS-ID value and the request type for **rad_group2**:

```
switch(config)# aaa radius-attribute group rad_group2
switch(config-radius-attr)# no nas-id
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-radius-attr` | Administrators or local user group members with execution rights for this command. |

## nas-ip-addr request-type authentication

```
nas-ip-addr request-type authentication
no nas-ip-addr request-type authentication
```

### Description

For the selected (by context) RADIUS server group, configures the **NAS-IP-Address** attribute for inclusion in management user request packets.

The no form of this command unconfigures the **NAS-IP-Address** attribute for inclusion in management user request packets.

Nas-ip-addr attributes only apply to management user requests.

### Examples

Configuring the **NAS-IP-Address** attribute for inclusion in management user request packets for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# nas-ip-addr request-type authentication
```

Unconfiguring the **NAS-IP-Address** attribute for inclusion in management user request packets for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# no nas-ip-addr request-type authentication
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-radius-attr` | Administrators or local user group members with execution rights for this command. |

## nas-ip-addr service-type user-management

```
nas-ip-addr service-type user-management
no nas-ip-addr service-type user-management
```

### Description

For the selected (by context) RADIUS server group, configures the **NAS-IP-Address** attribute for inclusion in management user service type request packets.

The no form of this command unconfigures the **NAS-IP-Address** attribute for inclusion in management user service type request packets.

Nas-ip-addr attributes only apply to management user requests.

### Examples

Configuring the **NAS-IP-Address** attribute for inclusion in management user service type request packets for **rad_group1:**

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# nas-ip-addr service-type user-management
```

Unconfiguring the **NAS-IP-Address** attribute for inclusion in management user service type request packets for **rad_group1:**

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# no nas-ip-addr service-type user-management
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-radius-attr` | Administrators or local user group members with execution rights for this command. |

# tunnel-private-group-id request-type

```
tunnel-private-group-id request-type {authentication | accounting | both}
no tunnel-private-group-id request-type {authentication | accounting | both}
```

### Description

For the selected (by context) RADIUS server group, configures the request type for which the attribute configured with command **tunnel-private-group-id value** will be included.

The **no** form of this command unconfigures the specified request type.

Tunnel-private-group-id attributes only apply to port access requests.

| Parameter | Description |
|---|---|
| `authentication` | Selects the authentication request type. |
| `accounting` | Selects the accounting request type. |
| `both` | Selects both the authentication and accounting request types. |

### Examples

Configuring the authentication request type for **rad_group1**:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# tunnel-private-group-id request-type authentication
```

Configuring both the authentication and accounting request types for **rad_group2**:

```
switch(config)# aaa radius-attribute group rad_group2
switch(config-radius-attr)# tunnel-private-group-id request-type both
```

Unconfiguring the authentication request type for **rad_group2**:

```
switch(config)# aaa radius-attribute group rad_group2
switch(config-radius-attr)# no tunnel-private-group-id request-type authentication
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-radius-attr` | Administrators or local user group members with execution rights for this command. |

## tunnel-private-group-id value

```
tunnel-private-group-id value {static | dynamic}
no tunnel-private-group-id value {static | dynamic}
```

### Description

For the selected (by context) RADIUS server group, configures the **tunnel-private-group-id** value (type 81, RFC 2868) that will be sent in RADIUS access-request packets. This is used for VLAN identification.

The no form of this command unconfigures specified **tunnel-private-group-id** value.

Tunnel-private-group-id attributes only apply to port access requests.

| Parameter | Description |
|---|---|
| `static` | Causes the switch to send (as an attribute value) the native VLAN of the client port. |
| `dynamic` | Causes the switch to send (as an attribute value) the client VLAN assigned by server. This is applicable during re-authentication scenarios. |

### Examples

Configuring **rad_group1** for the RADIUS attribute to identify the native VLAN of the client port:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# tunnel-private-group-id value static
```

Configuring **rad_group2** for the RADIUS attribute to identify the client VLAN assigned by the server:

```
switch(config)# aaa radius-attribute group rad_group2
switch(config-radius-attr)# tunnel-private-group-id value dynamic
```

Unconfiguring (for **rad_group1**) the RADIUS attribute to identify the native VLAN of the client port:

```
switch(config)# aaa radius-attribute group rad_group1
switch(config-radius-attr)# no tunnel-private-group-id value static
```

Unconfiguring (for **rad_group3**) both the group-ID value and request type:

```
switch(config)# aaa radius-attribute group rad_group3
switch(config-radius-attr)# no tunnel-private-group-id
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-radius-attr` | Administrators or local user group members with execution rights for this command. |

## vsa vendor

```
vsa vendor aruba type avpair group dfp-client-info
{no} vsa vendor aruba type avpair group dfp-client-info
```

### Description

This command enables AOS-CX integration with Aruba Clearpass by allowing the switch to send Vendor-Specific Attributes (VSAs) for the **Aruba** vendor in RADIUS interim packets (such as accounting packets). Device fingerprints are sent to a ClearPass RADIUs server through accounting updates using Aruba-AVPair(67) VSAs. When configured, device fingerprint information for an authenticated port-access client is obtained from protocols such as LLDP, DHCP, CDP, and HTTP and sent to RADIUS accounting interim packets.

### Examples

The following command configures Clearpass integration using device fingerprinting information sent through RADIUS accounting updates.

```
switch(config)# aaa radius-attribute group radius
switch(config-radius-attr)#vsa vendor aruba type avpair group dfp-client-info
```

The following command stops the switch from sending device fingerprinting infromation through RADIUS accounting updates.

```
switch(config-radius-attr)#no vsa vendor aruba type avpair group dfp-client-info
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# Chapter 130

# RADIUS dynamic authorization commands

## radius dyn-authorization enable

```
radius dyn-authorization enable
no radius dyn-authorization enable
```

### Description

Enables RADIUS dynamic authorization. This command must be issued before the configuration set with other **radius dyn-authorization** commands takes effect.

The no form of this command disables RADIUS dynamic authorization.

### Examples

Enabling RADIUS dynamic authorization:

```
switch(config)# radius dyn-authorization enable
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## radius dyn-authorization client

```
radius dyn-authorization client {<IPV4> | <IPV6> | <HOSTNAME>}
   [secret-key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
   [time-window <WIDTH>] [vrf <VRF-NAME>] [replay-protection {enable|disable}]
   [rfc5176-enforcement-mode <strict|loose>]
   no...
```

### Description

Configures RADIUS dynamic authorization for the specified client on the specified (or **default**) VRF.

The **no** form of this command unconfigures RADIUS dynamic authorization for the specified client on the specified (or **default**) VRF.

## Guidelines

Configure **rfc5176-enforcement-mode loose** when integrating with the Adaptive Network Control (ANC) feature of Cisco ISE, as authorization attributes are sent as part of Disconnect-Requests (code 40) instead of CoA-Requests(code 43).

The following are the only authorization attributes that are accepted in the disconnect requests in the loose mode:

1. Cisco-AVPair='subscriber:command=bounce-host-port'
2. Cisco-AVPair='subscriber:command=disable-host-port'
3. Cisco-AVPair='subscriber:command=reauthenticate' and Cisco-AVPair='subscriber:reauthenticate-type=<last|rerun>

The **reauthenticate-type=rerun** option is not supported if concurrent onboarding is enabled for the client.

| Parameter | Description |
|---|---|
| `<IPV4> \| <IPV6> \| <HOSTNAME>` | Specifies the client IPv4 address, IPv6 address, or host name. |
| `secret-key [plaintext <PASSKEY> \| ciphertext <PASSKEY>]` | Specifies the dynamic authorization server (RADIUS server) shared secret key required for client access. Provide either a plaintext or an encrypted shared-secret passkey. As per RFC 2865, the shared-secret can be a mix of alphanumeric and special characters. Plaintext passkeys are between 1 and 32 alphanumeric and special characters.<br>**NOTE:** When **secret-key** is entered without either sub-parameter, plaintext shared secret prompting occurs upon pressing Enter. Enter must be pressed immediately after the **secret-key** parameter without entering other parameters. The entered shared secret characters are masked with asterisks. |
| `rfc5176-enforcement-mode <strict\|loose)` | Configure the enforcement mode of RFC5176. The default mode is **strict** and in this mode, no authorization attributes are allowed as part of disconnect requests. When configured mode is **loose**, then the authorization attributes are accepted in disconnect requests. |
| `time-window <WIDTH>` | Specifies the width of the synchronization window (in seconds) between the RADIUS dynamic authorization client and the RADIUS dynamic authorization server. Default 300. Range: 1 to 65535. |
| `replay-protection {enable\|disable}` | Enables or disables RADIUS dynamic authorization replay protection for the specified client on the specified (or **default**) VRF. By default, the replay-protection is set to disabled. |
| `vrf <VRF-NAME>` | Specifies the VRF on which the identified client is connected. When omitted, VRF **default** is assumed. |

### Examples

Configuring RADIUS dynamic authorization with replay protection for a client on the default VRF:

```
switch(config)# radius dyn-authorization client 1.1.2.5 replay-protection enable
```

Configuring RADIUS dynamic authorization with time window and shared secret for a client on the default VRF:

```
switch(config)# radius dyn-authorization client 1.1.2.7 time-window 8
                secret-key plaintext skF82#450
```

Configuring loose enforcement of RFC5176:

```
switch(config)# radius dyn-authorization client 1.1.1.1 rfc5176-enforcement-mode
loose
```

Configuring RADIUS dynamic authorization with a prompted shared secret:

```
switch(config)# radius dyn-authorization client 1.1.2.7 secret-key
Enter the RADIUS dyn-authorization key: *********
Re-Enter the RADIUS dyn-authorization key: *********
```

Configuring RADIUS dynamic authorization for a client on the adm2 VRF:

```
switch(config)# radius dyn-authorization client 1.1.2.1 vrf adm2
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | The **rfc5176-enforcement-mode** parameter was introduced. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## radius dyn-authorization client tls (RadSec)

```
radius dyn-authorization client [<IPV4> | <IPV6> | <HOSTNAME>]
   tls [replay-protection {enable|disable}][time-window <WIDTH>] [vrf <VRF-NAME>]
[rfc5176-enforcement-mode <strict|loose>]
```

```
no radius dyn-authorization client [<IPV4> | <IPV6> | <HOSTNAME>]
   tls [replay-protection {enable|disable}][time-window <WIDTH>] [vrf <VRF-NAME>]
[rfc5176-enforcement-mode <strict|loose>]
```

## Description

Enables TLS protection for a RADIUS dynamic authorization client on the specified (or **default**) VRF. RadSec is a protocol that supports RADIUS over TLS. The **no** form of this command deletes TLS protection for the dynamic authorization client.

RadSec server must be configured before configuring dynamic authorization.

## Guidelines

Configure **rfc5176-enforcement-mode loose** when integrating with the Adaptive Network Control (ANC) feature of Cisco ISE, as authorization attributes are sent as part of Disconnect-Requests (code 40) instead of CoA-Requests(code 43).

The following are the only authorization attributes that are accepted in the disconnect requests in the loose mode:

1. Cisco-AVPair='subscriber:command=bounce-host-port'
2. Cisco-AVPair='subscriber:command=disable-host-port'
3. Cisco-AVPair='subscriber:command=reauthenticate' and Cisco-AVPair='subscriber:reauthenticate-type=<last|rerun>

The **reauthenticate-type=rerun** option is not supported if concurrent onboarding is enabled for the client.

| Parameter | Description |
|---|---|
| `<IPV4> \| <IPV6> \| <HOSTNAME>` | Specifies the client IPv4 address, IPv6 address, or host name. |
| `replay-protection {enable\|disable}` | Enables or disables RADIUS dynamic authorization replay protection for the specified client on the specified (or **default**) VRF. By default, the replay-protection is set to disabled. |
| `time-window <WIDTH>` | Specifies the width of the synchronization window (in seconds) between the RADIUS dynamic authorization client and the RADIUS dynamic authorization server. Default 300. Range: 1 to 65535. |
| `vrf <VRF-NAME>` | Specifies the VRF on which the identified client is connected. When omitted, VRF **default** is assumed. |
| `rfc5176-enforcement-mode <strict\|loose>` | Configure the enforcement mode of RFC5176. The default mode is **strict** and in this mode, no authorization attributes are allowed as part of disconnect requests. When configured mode is **loose**, then the authorization attributes are accepted in disconnect requests. |

## Examples

Enables TLS protection for a RADIUS dynamic authorization client with replay protection and time window for a client on the default VRF:

```
switch(config)# radius dyn-authorization client 1.1.2.5 tls replay-protection
enable time-window 8
```

Configuring loose enforcement of RFC5176:

```
switch(config)# radius dyn-authorization client 1.1.1.1 tls rfc5176-enforcement-
mode loose
```

Deleting TLS protection for a dynamic authorization client on the adm2 VRF:

```
switch(config)# no radius dyn-authorization client 1.1.2.7 tls VRF adm2
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | The **rfc5176-enforcement-mode** parameter was introduced. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## radius dyn-authorization port

`radius dyn-authorization port <PORT-NUMBER>`

### Description

Sets the RADIUS dynamic authorization server UDP or TCP port.

| Parameter | Description |
|---|---|
| *<PORT-NUMBER>* | Specifies the UDP or TCP port. Default UDP: 3799 and TCP:2083. |

### Examples

Setting the RADIUS dynamic authorization server UDP port back to its default 3799:

```
switch(config)# radius dyn-authorization port 3799
```

Setting the RADIUS dynamic authorization server TCP port back to its default 2083:

```
switch(config)# radius dyn-authorization port 2083
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## show radius dyn-authorization

```
show radius dyn-authorization
```

### Description

Shows RADIUS dynamic authorization configuration and summarized statistics for all clients configured for dynamic authorization.

### Usage

Show command output item identification:

- **Radius Dynamic Authorization**: Enabled or Disabled status, system wide.
- **Radius Dynamic Authorization Port**: The UDP or TCP port used for dynamic authorization (default 3799).
- **Invalid Client Address in CoA Requests**: The number of CoA (change of authorization) requests received with an incorrect DAC (dynamic authorization client) address.
- **Invalid Client Address in Disconnect Requests**: The number of disconnect requests received with incorrect DAC address.
- **Disconnect Requests**: The number of disconnect requests received from the DAC.
- **Disconnect ACKs**: The number of Disconnect-ACKs sent to the DAC.
- **Disconnect NAKs**: The number of Disconnect-NAKs sent to the DAC.
- **CoA Requests**: The number of CoA-requests received from the DAC.
- **CoA ACKs**: The number of CoA-ACKs sent to the DAC.
- **CoA NAKs**: The number of CoA-NAKs sent to the DAC.

### Example

Showing RADIUS dynamic authorization summarized statistics for all clients configured for dynamic authorization:

```
switch# show radius dyn-authorization
Status and Counters - RADIUS Dynamic Authorization Information

  RADIUS Dynamic Authorization                       : Enabled
  RADIUS Dynamic Authorization UDP Port              : 3799
  Invalid Client Addresses in CoA Requests           : 0
  Invalid Client Addresses in Disconnect Requests: 0

Dynamic Authorization Client Information
==========================================

IP Address           : 1.1.2.1
VRF                  : adm2
Replay Protection    : Disabled
TLS Enabled          : Yes
Time Window          : 20
Disconnect Requests : 1
Disconnect ACKs      : 1
Disconnect NAKs      : 0
CoA Requests         : 7
CoA ACKs             : 2
CoA-NAKs             : 5
Shared-Secret        :
AQBapb+HsdpqV1Q3CPCBMQTG8ekK1cA+CyD0RvfbeA8BEgikCgAAAJOwZSNzA2SWrLA=


IP Address           : 1.1.2.5
VRF                  : default
Replay Protection    : Enabled
TLS Enabled          : No
Time Window          : 20
Disconnect Requests : 6
Disconnect ACKs      : 6
Disconnect NAKs      : 0
CoA Requests         : 9
CoA ACKs             : 5
CoA-NAKs             : 4
Shared-Secret        :
AQBapb+HsdpqV1Q3CPCBMQTG8ekK1cA+CyD0RvfbeA8BEgikCgAAAJOwZSNzA2SWrLA=


IP Address           : 1.1.2.7
VRF                  : default
Replay Protection    : Disabled
TLS Enabled          : Yes
Time Window          : 8
Disconnect Requests : 6
Disconnect ACKs      : 6
Disconnect NAKs      : 0
CoA Requests         : 9
CoA ACKs             : 5
CoA-NAKs             : 4
Shared-Secret        :
AQBapb+HsdpqV1Q3CPCBMQTG8ekK1cA+CyD0RvfbeA8BEgikCgAAAJOwZSNzA2SWrLA=
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show radius dyn-authorization client

```
show radius dyn-authorization client <IP-ADDR> [vrf <VRF-NAME>]
```

### Description

Shows RADIUS dynamic authorization statistics for the specified client on the specified VRF.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* | Specifies the client IPv4 or IPv6 address. |
| vrf *<VRF-NAME>* | Specifies the VRF on which the identified client is connected. When omitted, VRF **default** is assumed. |

### Usage

Show command output item identification:

- **Total Requests**: The number of Disconnect and CoA (change of authorization) requests received from the DAC (dynamic authorization client).
- **Authorize Only Requests**: The number of Disconnect and CoA requests received from the DAC with an "Authorize only" Service-Type attribute.
- **Malformed Requests**: The number of malformed Disconnect and CoA requests received from the DAC.
- **Bad Authenticator Requests**: The number of Disconnect and CoA requests received from this DAC with an invalid authenticator field.
- **Dropped Requests**: The number of Disconnect and CoA requests from this DAC that have been silently discarded for reasons other than malformed, bad authenticators, or unknown type.
- **Total ACK Responses**: The number of Disconnect-ACKs sent to the DAC.
- **Total NAK Responses**: The number of Disconnect-NAKs sent to the DAC.
- **Session Not Found Responses**: The number of Disconnect-NAKs sent to the DAC because no session context could be found.
- **User Sessions Modified**: The number of user sessions for which authorization changed due to Disconnect and CoA requests received from the DAC.

### Example

Showing RADIUS dynamic authorization statistics for client 1.1.2.1 on VRF default:

```
switch# show radius dyn-authorization client 1.1.2.1 vrf default
Status and Counters - RADIUS Dynamic Authorization Client Information

  VRF Name                  : default
  Authorization Client      : 1.1.2.1
  Unknown Packets           : 55
  Message-Type                  Disconnect       CoA
  ---------------------------------------------------------------
  Total Requests                2147483647       10
  Authorize Only Requests       10               10
  Malformed Requests            10               10
  Bad Authenticator Requests    2147483647       2147483647
  Dropped Requests              10               10
  Total ACK Responses           10               10
  Total NAK Responses           10               10
  Session Not Found Responses   10               10
  User Sessions Modified        20               20
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show radius dyn-authorization client tls (RadSec)

`show radius dyn-authorization client <IP-ADDR> tls [vrf <VRF-NAME>]`

### Description

Shows RADIUS dynamic authorization statistics for the specified client (with TLS) on the specified VRF.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* | Specifies the client IPv4 or IPv6 address. |
| vrf *<VRF-NAME>* | Specifies the VRF on which the identified client is connected. When omitted, VRF **default** is assumed. |

### Usage

Show command output item identification:

- **Total Requests**: The number of Disconnect and CoA (change of authorization) requests received from the DAC (dynamic authorization client).
- **Authorize Only Requests**: The number of Disconnect and CoA requests received from the DAC with an "Authorize only" Service-Type attribute.
- **Malformed Requests**: The number of malformed Disconnect and CoA requests received from the DAC.
- **Bad Authenticator Requests**: The number of Disconnect and CoA requests received from this DAC with an invalid authenticator field.
- **Dropped Requests**: The number of Disconnect and CoA requests from this DAC that have been silently discarded for reasons other than malformed, bad authenticators, or unknown type.
- **Total ACK Responses**: The number of Disconnect-ACKs sent to the DAC.
- **Total NAK Responses**: The number of Disconnect-NAKs sent to the DAC.
- **Session Not Found Responses**: The number of Disconnect-NAKs sent to the DAC because no session context could be found.
- **User Sessions Modified**: The number of user sessions for which authorization changed due to Disconnect and CoA requests received from the DAC.

### Example

Showing RADIUS dynamic authorization statistics for client 1.1.2.1 with TLS enabled on VRF default:

```
switch# show radius dyn-authorization client 1.1.2.1 vrf default
Status and Counters - RADIUS Dynamic Authorization Client Information

  VRF Name                 : default
  Authorization Client     : 1.1.2.1
  TLS Enabled              : Yes
  Unknown Packets          : 55
  Message-Type                   Disconnect       CoA
  ---------------------------------------------------------------
  Total Requests                 2147483647       10
  Authorize Only Requests        10               10
  Malformed Requests             10               10
  Bad Authenticator Requests     2147483647       2147483647
  Dropped Requests               10               10
  Total ACK Responses            10               10
  Total NAK Responses            10               10
  Session Not Found Responses    10               10
  User Sessions Modified         20               20
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# Chapter 131

# RA guard policy commands

## hop limit

```
hop limit [minimum | maximum] <HOP-LIMIT>
no hop limit [minimum | maximum] <HOP-LIMIT>
```

### Description

Enables verification of the advertised hop count limit if the RA guard policy is applied on a VLAN or interface. RA packets with the hop limit within the specified minimum and maximum values are processed. If none of the values are specified for hop limit, the default range is 1-255. If hop limit is not enabled, packets are not validated for hop limit.

The **no** form of the command disables the hop limit on the specified RA guard policy.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

| Parameter | Description |
|---|---|
| *<HOP-LIMIT>* | Specifies the hop-limit value. Range: 1-255. |
| `minimum` | Specifies the minimum value for the hop-limit range. Default: 1, Range 1-255.<br>The range is minimum–255 if only a minimum value is specified. |
| `maximum` | Specifies the maximum value for the hop-limit range. Default: 255, Range 1-255.<br>The range is 1–maximum if only a maximum value is specified. |

### Examples

Enabling the hop limit on the RA guard policy and adding minimum and maximum values for hop limit on the policy:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# hop-limit enable
switch(config-raguard-policy)# hop-limit maximum 150
switch(config-raguard-policy)# hop-limit minimum 50
```

Disabling the hop limit on the RA guard policy:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# no hop-limit enable
```

Removing minimum and maximum values for the hop limit on the RA guard policy:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# no hop-limit maximum 150
switch(config-raguard-policy)# no hop-limit minimum 50
switch(config-raguard-policy)# no hop-limit maximum
switch(config-raguard-policy)# no hop-limit minimum
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-raguard-policy` | Administrators or local user group members with execution rights for this command. |

## ipv6 nd-snooping ra-guard policy

```
ipv6 nd-snooping ra-guard policy <POLICY-NAME>
no ipv6 nd-snooping ra-guard policy <POLICY-NAME>
```

### Description

Creates the Router Advertisement (RA) guard policy with the given name and enters the RA guard policy configuration context.

The **no** form of the command removes the specified RA guard policy from the switch.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

| Parameter | Description |
|---|---|
| *<POLICY-NAME>* | Specifies the name of the RA guard policy. Maximum length: 64. |

### Examples

Creating the RA guard policy globally with a specified name:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)#
```

Deleting the specified RA guard policy:

```
switch(config)# no ipv6 nd-snooping ra-guard policy <POLICY-NAME>
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## managed-config-flag

```
managed-config-flag [on | off]
no managed-config-flag [on | off]
```

### Description

Enables the verification of the advertised manage configuration flag. Verifies that the advertised managed address configuration flag is On or Off based on the configured value.

The **no** form of the command disables the manage configuration flag verification.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

| Parameter | Description |
|---|---|
| `on` | Verifies that the advertised managed address configuration flag is On. |
| `off` | Verifies that the advertised managed address configuration flag is Off. |

### Examples

Enabling managed configuration flag verification:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# managed-config-flag off
switch(config-raguard-policy)# managed-config-flag on
```

Disabling managed configuration flag verification:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# no managed-config-flag
switch(config-raguard-policy)# no managed-config-flag off
switch(config-raguard-policy)# no managed-config-flag on
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-raguard-policy` | Administrators or local user group members with execution rights for this command. |

## match access-list

```
match access-list <ACL-NAME>
no match access-list <ACL-NAME>
```

### Description

Configures the access list to an RA guard policy. The access list has to be created with the desired match criteria before adding it into RA guard policy. Advertised packets are verified for the match criteria when an RA guard policy with matched access list is enabled on a trusted port or VLANs.

The **no** form of the command removes the access list from the RA guard policy.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

| Parameter | Description |
|---|---|
| *<ACL-NAME>* | Specifies the name of the access list to be matched. |

### Examples

Adding an access list named Example_ACL to the RA guard policy POL1:

```
switch(config)# ipv6 nd-snooping ra-guard policy POL1
switch(config-raguard-policy)# match access-list Example_ACL
```

Deleting the access list named Example_ACL from the RA guard policy POL1:

```
switch(config)# ipv6 nd-snooping ra-guard policy POL1
switch(config-raguard-policy)# no match access-list Example_ACL
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-raguard-policy` | Administrators or local user group members with execution rights for this command. |

## match prefix-list

```
match prefix-list <PREFIX-LIST-NAME>
no match prefix-list <PREFIX-LIST-NAME>
```

### Description

Configures a prefix-list for the RA guard policy. Advertised prefixes in RA packets are compared against the configured prefix-list and if there is no match, the RA packets are dropped. If the RA prefix list is not configured, this check is not performed.

The **no** form of the command removes the prefix list from the RA guard policy.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

| Parameter | Description |
|---|---|
| *<PREFIX-LIST-NAME>* | Specifies the name of the prefix list to be matched. |

### Examples

Adding a prefix list named PREFIX_LIST_EXAMPLE to the POLICY1 RA guard policy:

```
switch(config)# ipv6 nd-snooping ra-guard policy POLICY1
switch(config-raguard-policy)# match prefix-list PREFIX_LIST_EXAMPLE
```

Deleting the prefix list named PREFIX_LIST_EXAMPLE from the POLICY1 RA guard policy:

```
switch(config)# ipv6 nd-snooping ra-guard policy POLICY1
switch(config-raguard-policy)# no match pefix-list PREFIX_LIST_EXAMPLE
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-raguard-policy` | Administrators or local user group members with execution rights for this command. |

## nd-snooping ra-guard attach-policy

```
nd-snooping ra-guard attach-policy <POLICY-NAME>
no nd-snooping ra-guard attach-policy <POLICY-NAME>
```

### Description

Applies the created RA guard policy to a specific L2 port or VLAN.

The **no** form of the command detaches the specified RA guard policy from the L2 port or VLAN.

| Parameter | Description |
|---|---|
| *<POLICY-NAME>* | Specifies the name of the RA guard policy. |

### Usage

In the interface configuration (config-if) context:

- RA guard must be enabled on member VLANs of the port for which RA packets need to be inspected using the policy.

In the interface configuration (config-if) and VLAN configuration (config-vlan) contexts:

- RA packets received on untrusted ports are dropped without any inspection.
- RA packets received on trusted ports are validated against the policy.
- The applied policy takes effect only if ND snooping is enabled globally and both ND snooping and RA guard are enabled under the VLAN context.

Policy precedence between VLAN and port:

- If the policy is attached to both VLAN and port, the port policy takes precedence over the VLAN policy.

- Only one policy can be attached per VLAN or port.
- If the port belongs to a different VLAN (for example, in the case of a trunk port) the tagged VLAN takes priority. If the packets are untagged, the native VLAN policy takes precedence.

## Examples

Attaching the RA guard policy to an L2 port:

```
switch(config)# interface 1/1/10
switch(config-if)# nd-snooping ra-guard attach-policy POLICY_NAME
```

Attempting to attach the RA guard policy to a port where routing is enabled, the policy is not configured, or it is an untrusted port:

(When prompted, enter "Y" to create the policy and attach it to the interface. )

```
switch(config)# interface 1/1/10
switch(config-if)# nd-snooping ra-guard attach-policy POLICY_NAME
RA Guard policy can't be attached to an interface with routing enabled.

switch(config-if)# no routing
switch(config-if)# nd-snooping trust
switch(config-if)# nd-snooping ra-guard attach-policy POLICY_NAME
switch(config-if)#6300(config-if)# nd-snooping ra-guard attach-policy POLICY_NOT_
CREATED
RA guard policy does not exist.
Do you want to create (y/n)?

switch(config)# interface 1/1/10
switch(config-if)# nd-snooping ra-guard attach-policy AA
RA Guard policy is ineffective, as 1/1/10 is configured as untrusted port.
```

Attaching the RA guard policy to a VLAN:

```
switch(config)# vlan 10
switch(config-vlan-10)# nd-snooping ra-guard attach-policy POLICY_NAME
```

Detaching the RA guard policy:

```
switch(config)# interface 1/1/10
switch(config-if)# no nd-snooping ra-guard attach-policy POLICY_NAME
```

Attempting to detach a RA guard policy which is not applied on the port or VLAN:

```
switch(config)# interface 1/1/10
switch(config-if)# no nd-snooping ra-guard attach-policy POLICY_NAME
RA Guard Policy POLICY_NAME is not applied on this port.
```

Attempting to detach a non-existent RA guard policy:

```
switch(config-if)# no nd-snooping ra-guard attach-policy POLICY_NOT_CREATED
Could not find the policy POLICY_NOT_CREATED.
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if`<br>`config-vlan-<VLAN-ID>` | Administrators or local user group members with execution rights for this command. |

## other-config-flag

```
other-config-flag [on | off]
no other-config-flag [on | off]
```

### Description

Enables the verification of the advertised other configuration flag. Verifies that the advertised Other Stateful Configuration flag is On or Off based on the configured value.

The **no** form of the command disables other configuration flag verification.

ND snooping must be enabled in both the global context and the config-vlan context before this command can be used.

| Parameter | Description |
|---|---|
| `on` | Verifies that the advertised Other Stateful Configuration flag is On. |
| `off` | Verifies that the advertised Other Stateful Configuration flag is Off. |

### Examples

Enabling other configuration flag verification:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# other-config-flag off
switch(config-raguard-policy)# other-config-flag on
```

Disabling other configuration flag verification:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# no other-config-flag
switch(config-raguard-policy)# no other-config-flag off
switch(config-raguard-policy)# no other-config-flag on
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-raguard-policy` | Administrators or local user group members with execution rights for this command. |

## router-preference

```
router-preference {high | medium | low}
no router-preference [high | medium | low]
```

### Description

Enables the router preference verification on the RA guard policy for advertised packets and processes the packets only if the router preference is lower than the configured value. If the router preference is not configured, this validation is bypassed.

The **no** form of this command disables router preference verification on the RA guard policy.

| Parameter | Description |
|---|---|
| `high` | Sets the maximum router preference to high. |
| `medium` | Sets the maximum router preference to medium. |
| `low` | Sets the maximum router preference to low. |

### Examples

Enabling router preference verification with the maximum router preference set to high:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# router-preference high
```

Disabling router preference verification:

```
switch(config)# ipv6 nd-snooping ra-guard policy <POLICY-NAME>
switch(config-raguard-policy)# no router-preference
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 or earlier | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-raguard-policy` | Administrators or local user group members with execution rights for this command. |

## show nd-snooping ra-guard interface

`show nd-snooping ra-guard interface <INTERFACE-ID>`

### Description

Shows RA guard counters for the specified interface. Counters are cleared once the RA guard policy is detached from the interface.

| Parameter | Description |
|---|---|
| *<INTERFACE-ID>* | Specifies the interface for which the RA guard counters are displayed. |

### Examples

Showing RA guard counters for interface 1/1/1:

```
switch# show nd-snooping ra-guard interface 1/1/1

  RA Guard Policy Counters
  ========================

  RA Guard Policy Applied       : POLICY_2
  RA Packets Received           : 10
  RA Packets Forwarded          : 5
  RA Packets Dropped            : 5 [Total]

                         reason : Managed flag error     [0]
                                  Other flag error       [0]
                                  Access list error      [0]
                                  Prefix list error      [0]
                                  Router preference error[0]
                                  Hop limit error        [5]
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show nd-snooping ra-guard policy

```
show nd-snooping ra-guard policy [<POLICY-NAME>]
```

### Description

Shows the RA guard policy configuration.

| Parameter | Description |
|---|---|
| *<POLICY-NAME>* | Specifies the name of the RA guard policy to be displayed. |

### Examples

Showing RA guard configuration:

```
switch# show nd-snooping ra-guard policy
RA Guard Policy                  Applied Ports                 Applied VLANs
----------------------------------------------------------------------------------
--------
POLICY_NAME1       1/1/25,1/1/27,1/1/29-1/1/44,1/1/46          10,20,50-100
POLICY_NAME2       1/1/1-1/1/24
```

```
switch# show nd-snooping ra-guard policy POLICY_NAME1

RA Guard policy Information
========================
Policy name             : POLICY_NAME1
Policy Applied Ports    : 1/1/25,1/1/27,1/1/29-1/1/44,1/1/46
Policy Applied VLANs    : 10,20,50-100
Hop Limit               : enabled
    minimum             : 50
    maximum             : 150
Managed config flag     : On
Other config flag       : On
Access List             : ACL1
Prefix List             : PREFIX_LIST_NAME
Router Preference       : high
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show nd-snooping ra-guard vlan

```
show nd-snooping ra-guard vlan <VLAN-ID>]
```

### Description

Shows RA guard counters for the specified VLAN. Counters are cleared once the RA guard policy is detached from the VLAN.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies a VLAN ID for which the RA guard counters are displayed. Range: 1 to 4094. |

### Examples

Showing RA guard counters for VLAN 2:

```
switch# show nd-snooping ra-guard vlan 2


  RA Guard Policy Counters
  ========================

  RA Guard Policy  Applied      : POLICY_1
  RA Packets Received           : 20
  RA Packets Forwarded          : 5
  RA Packets Dropped            : 15 [Total]

                       reason : Managed flag error     [1]
                                Other flag error       [4]
                                Access list error      [1]
                                Prefix list error      [4]
                                Router preference error[0]
                                Hop limit error        [5]
```

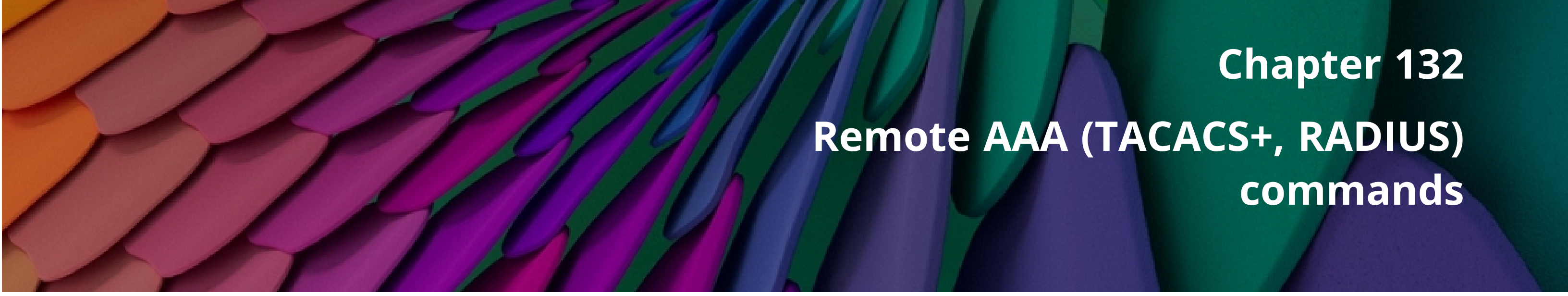
For more information on features that use this command, refer to the IP Services Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |



# Chapter 132

# Remote AAA (TACACS+, RADIUS) commands

## aaa accounting allow-fail-through

```
aaa accounting allow-fail-through
no aaa accounting allow-fail-through
```

### Description

Enables accounting fail-through. When this option is enabled, the next server or accounting method is attempted after an accounting failure.

The **no** form of this command disables accounting fail-through.The system only attempts to reach the next server or accounting method if there is an accounting failure due to an unreachable TACACS+ or RADIUS server or a shared key mismatch error between the switch and the server.

### Example

Enabling accounting fail-through:

```
switch(config)# aaa accounting allow-fail-through
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12.1000 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## aaa accounting all-mgmt

```
aaa accounting all-mgmt <CONNECTION-TYPE> start-stop {local | group <GROUP-LIST>}
no aaa accounting all-mgmt <CONNECTION-TYPE> start-stop {local | group <GROUP-LIST>}
```

### Description

Defines accounting as being local (with the name **local**) (the default). Or defines a sequence of remote AAA server groups to be accessed for accounting purposes.

For remote accounting, the information is sent to the first reachable remote server that was configured with this command for remote accounting. If no remote server is reachable, local accounting remains available. Each available connection type (channel) can be configured individually as either local or using remote AAA server groups. All server groups named in your command, must exist. This command can be issued multiple times, once for each connection type. Local is always available for any connection type not configured for remote accounting.

The system accounting log is not associated with any connection type (channel) and is therefore sent to the accounting method configured on the default connection type (channel) only.

The **no** form of this command removes for the specified connection type, any defined remote AAA server group accounting sequence. Local accounting is available for connection types without a configured remote AAA server group list (whether default or for the specific connection type).

| Parameter | Description |
|---|---|
| *<CONNECTION-TYPE>* | One of these connection types (channels):<br>**default**<br>Defines a list of accounting server groups to be used for the **default** connection type. This configuration applies to all other connection types (**console**, **ssh**, **https-server**, **telnet**) that are not explicitly configured with this command. For example, if you do not use **aaa accounting all-mgmt console...** to define the console accounting list, then this default configuration is used for console.<br>**console**<br>Defines a list of accounting server groups to be used for the **console** connection type.<br>**ssh**<br>Defines a list of accounting server groups to be used for the **ssh** connection type.<br>**https-server**<br>Defines a list of accounting server groups to be used for the **https-server** (REST, Web UI) connection type.<br>**telnet**<br>Defines a list of accounting server groups to be used for the **telnet** connection type. |
| `start-stop` | Selects accounting information capture at both the beginning and end of a process. |
| `local` | Selects local-only accounting when used without the **group** parameter. |
| `group` *<GROUP-LIST>* | Specifies the list of remote AAA server group names. Each name can be specified one time. Predefined remote AAA group names **tacacs** and **radius** are available. Although not a group name, predefined name **local** is available. User-defined TACACS+ and RADIUS server group names may also be used.<br>The remote AAA server groups are accessed in the order that the group names are listed in this command. Within each group, the servers are accessed in the order in which the servers were added to the group. Server groups are defined using command **aaa** |

| Parameter | Description |
|---|---|
| | **group server** and servers are added to a server group with the command **server**.<br>If the remote server(s) in the group is unreachable or if there is a key mismatch error between the switch and the AAA Server, then the next accounting method is attempted. |

## Usage

Local accounting is always active. It cannot be turned off.

## Examples

Defining the default accounting sequence based on two user-defined TACACS+ server groups, then the default TACACS+ server group, and finally (if needed), local accounting.

```
switch(config)# aaa accounting all-mgmt default start-stop group tg1 tg2 tacacs
local
```

Defining the console accounting sequence based on two user-defined TACACS+ server groups, then the default TACACS+ server group, and finally (if needed), local accounting.

```
switch(config)# aaa accounting all-mgmt console start-stop group tg2 tg3 tacacs
local
```

Defining the ssh accounting sequence based on one user-defined TACACS+ server group and then the default TACACS+ server group.

```
switch(config)# aaa accounting all-mgmt ssh start-stop group tg2 tacacs
```

Defining the Telnet accounting sequence based on one user-defined TACACS+ server group and then the default TACACS+ server groups.

```
switch(config)# aaa accounting all-mgmt telnet start-stop group tg1 tacacs
```

Defining the default accounting sequence based on two user-defined RADIUS server groups, then the default RADIUS server group, and finally (if needed), local accounting.

```
switch(config)# aaa accounting all-mgmt default start-stop group rg1 rg2 radius
local
```

Defining the https-server accounting sequence based on one user-defined RADIUS server group and then the default RADIUS server group.

```
switch(config)# aaa accounting all-mgmt https-server start-stop group rg1 radius
```

Setting local accounting for the default connection type:

```
switch(config)# aaa accounting all-mgmt default start-stop local
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08.0001 | Added the **telnet** parameter for the 6200, 6300, 6400 Switch Series. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# aaa accounting port-access (RADIUS only)

General syntax definition:

```
aaa accounting port-access {start-stop {{local | group <GROUP-NAME>} |{interim <INTERVAL>
group <GROUP-NAME>}}}
aaa accounting port-access {stop-only {local | group <GROUP-NAME>}}
no aaa accounting port-access [local | group | interim]
```

List of all possible syntax for this command:

```
aaa accounting port-access start-stop local
aaa accounting port-access start-stop group <GROUP-NAME>
aaa accounting port-access start-stop interim <INTERVAL> group <GROUP-NAME>
aaa accounting port-access stop-only local
aaa accounting port-access stop-only group <GROUP-NAME>

no aaa accounting port-access
no aaa accounting port-access local
no aaa accounting port-access group
no aaa accounting port-access interim
```

## Description

Configures port access accounting information that is captured for 802.1X and MAC-authenticated clients.

Defines port access accounting as being local (with the parameter **local**) (the default). Or defines port access accounting as being remote (with the parameter group <*GROUP-NAME*>) with a sequence of remote RADIUS servers in a single RADIUS server group to be accessed for port access accounting purposes.

For remote RADIUS port access accounting, the information is sent to the first reachable remote RADIUS server in the specified group. If a user-defined RADIUS server group is named in your command, it must exist.

The **no** form of this command works as follows:

- **no aaa accounting port-access**: Globally unconfigures port access accounting.
- **no aaa accounting port-access local**: Unconfigures local port access accounting.
- **no aaa accounting port-access group**: Unconfigures remote port access accounting.
- **no aaa accounting port-access interim**: Unconfigures interim accounting updates.

| Parameter | Description |
|---|---|
| `start-stop` | Selects accounting information capture from the point at which the client is authenticated until the client disconnects. |
| `stop-only` | Selects accounting information capture only at the time when a client disconnects. |
| `local` | Selects local-only accounting. |
| `group` *<GROUP-NAME>* | Specifies a single RADIUS server group, either the built-in group named `radius` or a user-defined RADIUS server group. Only one RADIUS server group name can be provided. |
| `interim` *<INTERVAL>* | Enables interim accounting updates (between the start and stop) and specifies the interval at which the interim updates will be provided. Default: 60 minutes. Range: 1 to 525600 minutes. |

## Examples

Configuring start-stop port access local accounting:

```
switch(config)# aaa accounting port-access start-stop local
```

Configuring start-stop port access remote accounting using the built-in **radius** server group:

```
switch(config)# aaa accounting port-access start-stop group radius
```

Configuring start-stop port access remote accounting using the built-in **radius** server group and enabling interim accounting updates with an interval of 60 minutes:

```
switch(config)# aaa accounting port-access start-stop interim 60 group radius
```

Configuring stop-only port access remote accounting using the built-in **radius** server group:

```
switch(config)# aaa accounting port-access stop-only group radius
```

Unconfiguring remote port access accounting:

```
switch(config)# no aaa accounting port-access group
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## aaa authentication allow-fail-through

```
aaa authentication allow-fail-through
no aaa authentication allow-fail-through
```

### Description

Enables authentication fail-through. If this feature is enabled, the next server or authentication method is tried after an authentication failure.

The **no** form of this command disables authentication fail-through. The system only attempts to reach the next server or authentication method if there is an accounting failure due to an unreachable TACACS+/RADIUS server or a shared key mismatch error between the switch and the server.

If your switch uses command authorization, best practices is to configure authorization fail-through before configuring authentication fail-through. If not, the switch may fall into an unusable state where authorization will fail for all commands.

### Example

Enabling authentication fail-through:

```
switch(config)# aaa authentication allow-fail-through
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# aaa authentication login

```
aaa authentication login <CONNECTION-TYPE> {local | group <GROUP-LIST>}
no aaa authentication login <CONNECTION-TYPE> {local | group <GROUP-LIST>}
```

## Description

Defines authentication as being local (with the name **local**) (the default). Or defines a sequence of remote AAA server groups to be accessed for authentication purposes. Each available connection type (channel) can be configured individually as either local or using remote AAA server groups. All server groups named in your command, must exist. This command can be issued multiple times, once for each connection type. Local is always available for any connection type not configured for remote AAA authentication.

If you do not want local authentication to occur in cases where all AAA servers contacted reject the user's credentials, do not enable authentication fail-through (command **aaa authentication allow-fail-through**).

The **no** form of this command removes for the specified connection type, any defined remote AAA server group authentication sequence. Local authentication is available for connection types without a configured remote AAA server group list (whether default or for the specific connection type).

| Parameter | Description |
|---|---|
| *<CONNECTION-TYPE>* | One of these connection types (channels):<br>**default**<br>Defines a list of AAA server groups to be used for the **default** connection type. This configuration applies to all other connection types (**console**, **ssh**, **https-server**, **telnet**) that are not explicitly configured with this command. For example, if you do not use **aaa accounting all-mgmt console...** to define the console accounting list, then this default configuration is used for console.<br>**console**<br>Defines a list of AAA server groups to be used for the **console** connection type.<br>**ssh**<br>Defines a list of AAA server groups to be used for the **ssh** connection type.<br>**https-server**<br>Defines a list of AAA server groups to be used for the **https-server** (REST, Web UI) connection type.<br>**telnet**<br>Defines a list of AAA server groups to be used for the **telnet** connection type. |
| `local` | Selects local-only authentication when used without the **group** parameter. |

| Parameter | Description |
|---|---|
| `group <GROUP-LIST>` | Specifies the list of remote AAA server group names. Each name can be specified one time. Predefined remote AAA group names **tacacs** and **radius** are available. Although not a group name, predefined name **local** is available. User-defined TACACS+ and RADIUS server group names may also be used.<br>The remote AAA server groups are accessed in the order that the group names are listed in this command. Within each group, the servers are accessed in the order in which the servers were added to the group. Server groups are defined using command **aaa group server** and servers are added to a server group with the command **server**. If the remote server(s) in the group is unreachable or if there is a key mismatch error between switch and the AAA Server, then the next authentication method is attempted. |

## Examples

Defining the default authentication sequence based on two user-defined TACACS+ server groups, then the default TACACS+ server group, and finally (if needed), local authentication.

```
switch(config)# aaa authentication login default group tg1 tg2 tacacs local
```

Defining the default authentication sequence based on two user-defined TACACS+ server groups, then the default TACACS+ server group, and finally (if needed), local authentication.

```
switch(config)# aaa authentication login console group tg2 tg3 tacacs local
```

Defining the ssh authentication sequence based on one user-defined TACACS+ server group and then the default TACACS+ server group.

```
switch(config)# aaa authentication login ssh group tg2 tacacs
```

Defining the Telnet authentication sequence with two user-defined TACACS+ server groups, the default TACACS+ server group, and finally (if needed), local authentication.

```
switch(config)# switch(config)# aaa authentication login telnet group tg1 tg2
tacacs local
```

Defining the default authentication sequence based on two user-defined RADIUS server groups, then the default RADIUS server group, and finally (if needed), local authentication.

```
switch(config)# aaa authentication login default group rg1 rg2 radius local
```

Defining the https-server authentication sequence based on one user-defined RADIUS server group and then the default RADIUS server group.

```
switch(config)# aaa authentication login https-server group rg1 radius
```

Setting local authentication for the default connection type:

```
switch(config)# aaa authentication login default local
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08.0001 | Added the **telnet** parameter for the 6200, 6300, 6400 Switch Series. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## aaa authorization allow-fail-through

```
aaa authorization allow-fail-through
no aaa authorization allow-fail-through
```

### Description

Enables authorization fail-through. When this option is enabled, the next server or authorization method is attempted after an authorization failure.

The **no** form of this command disables authorization fail-through. The system only attempts to reach the next server or authorization method if there is an authorization failure due to an unreachable TACACS+ server or a shared key mismatch error between the switch and the server.

If your switch uses command authorization, best practices is to configure authorization fail-through before configuring authentication fail-through. If not, the switch may fall into an unusable state where authorization will fail for all commands.

### Example

Enabling authorization fail-through:

```
switch(config)# aaa authorization allow-fail-through
```

The following configurations use authorization fail-through in different scenarios.

Example configuration one:

```
aaa authentication allow-fail-through
aaa authorization allow-fail-through
aaa group server tacacs CPPM-TACACS
server 172.16.1.12
aaa authentication login ssh group CPPM-TACACS local
aaa authorization commands ssh group CPPM-TACACS local
```

Example configuration one does not support authentication via the TACACS+ server for a locally configured user. If the user is configured locally and that user does not have a profile present in the TACACS+ server, authentication fails with TACACS+, but the user is authenticated successfully with local authentication. Similarly, if authorization is rejected, the user is authorized locally with a fail-through configuration.

Example configuration two:

```
aaa group server tacacs CPPM-TACACS
server 172.16.1.12
aaa authentication allow-fail-through
aaa authorization allow-fail-through
aaa authentication login ssh group CPPM-TACACS local
aaa authorization commands ssh group local CPPM-TACACS
```

With configuration two, if a user's profile is configured only in the TACACS+ server, user authorization is rejected locally and is authorized with TACACS using the fail-through configuration. When authentication fail-through is configured, if the first authentication method fails, authentication is attempted using the next server or authentication method. The authorization fail-through is based on the authorization sequence, and is independent of the authentication method of the user.

Example configuration three:

```
aaa group server tacacs CPPM-TACACS
server 172.16.1.12
aaa group server tacacs TACACS
server 192.168.10.15
aaa authentication allow-fail-through
aaa authorization allow-fail-through
aaa authentication login ssh group CPPM-TACACS local
aaa authorization commands ssh group TACACS local
```

Example configuration four:

```
aaa group server radius RAD-GRP
server 172.16.1.12
aaa group server tacacs TACACS
server 192.168.10.15
aaa authentication allow-fail-through
aaa authorization allow-fail-through
aaa authentication login ssh group RAD-GRP  local
aaa authorization commands ssh group TACACS local
```

With configurations three and four, the **CPPM-TACACS** or **RAD-GRP** groups reject authentication requests for locally configured users, and the users are authenticated locally with fail-through. Authorization is attempted with the TACACS group in these configurations, and if this authorization attempt fails, the user will be authorized locally due to the fail-through configuration.

When authorization is rejected by multiple servers/server groups due to the fail-through configuration, a delay may be seen while executing commands.

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12.1000 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## aaa authorization commands

```
aaa authorization commands <CONNECTION-TYPE> {local | none}
no aaa authorization commands <CONNECTION-TYPE> {local | none}
aaa authorization commands <CONNECTION-TYPE> group <GROUP-LIST>
no aaa authorization commands <CONNECTION-TYPE> group <GROUP-LIST>
```

### Description

Defines authorization as being basic local RBAC (specified as **none**), or as full-fledged local RBAC specified as **local** (the default), or as remote TACACS+ (specified with group <*GROUP-LIST*>). Each available connection type (channel) can be configured individually. All server groups named in the command, must exist. This command can be issued multiple times, once for each connection type.

The **no** form of this command unconfigures authorization for the specified connection type, reverting to the default of **local**.

Although only TACACS+ servers are supported for remote authorization, local authorization (basic or full-fledged) can be used with remote RADIUS authentication. If your switch uses command authorization, best practices is to configure authorization fail-through before configuring authentication fail-through. If not, the switch may fall into an unusable state where authorization will fail for all commands.

| Parameter | Description |
|---|---|
| *<CONNECTION-TYPE>* | One of these connection types (channels):<br>**default**<br>Selects the **default** connection type for configuration. This configuration applies to all other connection types (**console**, **ssh**, **telnet**) that are not explicitly configured with this command. For example, if you do not use **aaa authorization commands console...** to define the console authorization list, then this default configuration is used for console. |

| Parameter | Description |
|---|---|
|  | **console**<br>Selects the **console** connection type for configuration.<br>**ssh**<br>Selects the **ssh** connection type for configuration.<br>**telnet**<br>Selects the **telnet** connection type for configuration. |
| `local` | When used alone without group *<GROUP-LIST>*, selects local authorization which can be used to provide authorization for a purely local setup without any remote AAA servers and also for when RADIUS is used for remote Authentication and Accounting but Authorization is local. When used after **group**, provides for fallback (to full-fledged local authorization) when every server in every specified TACACS+ server group cannot be reached.<br>**NOTE:** If any TACACS+ server in the specified groups is reachable, but the command fails to be authorized by that server, the command is rejected and local authorization is never attempted. Local authorization is only attempted if every TACACS+ server cannot be reached. |
| `none` | When used alone without group *<GROUP-LIST>*, selects basic local RBAC authorization, for use with the built-in user groups (**administrators**, **operators**, **auditors**). When used after **group**, provides for fallback (to basic local RBAC authorization) when every server in every specified TACACS+ server group cannot be reached.<br>**NOTE:** With **none**, for users belonging to user-defined user groups, all commands can be executed regardless of what authorization rules are defined in such groups. For per-command local authorization, use **local** instead. |
| `group` *`<GROUP-LIST>`* | Specifies the list of remote AAA server group names. Predefined remote AAA group name **tacacs** is available. User-defined TACACS+ server group names may also be used. The remote AAA server groups are accessed in the order that the group names are listed in this command. Within each group, the servers are accessed in the order in which the servers were added to the group. Server groups are defined using command **aaa server group** and servers are added to a server group using command **server**.<br>It is recommended to always include either the special name **local** or **none** as the last name in the group list. If both **local** and **none** are omitted, and no remote AAA server is reachable (or the first reachable server cannot authorize the command), command execution for the current user will not be possible.<br>If the AAA server(s) in the group are not reachable, or if there is a key mismatch error between the server and the switch, the next authorization method is attempted. |

## Usage

### TACACS+ server authorization considerations

Use caution when configuring authorization, as it has no fail through. If the switch is not configured properly, the switch might get into an unusable state in which all command execution is prohibited.

To prevent authorization difficulties:

- Make sure that all listed TACACS+ servers can authorize users for command execution.
- Make sure that credential database changes are promptly synchronized across all TACACS+ servers.
- Make sure either **local** or **none** is included as the last name in the group list. If both **local** and **none** are omitted, and no remote TACACS+ server is reachable (or the first reachable server cannot authorize), authorization will not be possible.
- Although not recommended, if you choose to omit both **local** and **none** from the list, and are manipulating configuration files, special caution is necessary. If the source configuration includes TACACS+ authorization and you are copying configuration from an existing switch into the running configuration of a new switch, and you have not yet configured the interface or routing information to reach the TACACS+ server, the switch will enter an unusable state, requiring hard reboot.

  To avoid getting into this situation that can occur when **local** and **none** have been omitted, do either of the following:

  - In the configuration source, delete or comment-out the line configuring remote authorization. Then, after the configuration copy and paste, manually configure authorization.
  - Move the line configuring the authorization to the end of the source configuration before copying and pasting.

### Examples

Defining the default authorization sequence based on a user-defined TACACS+ server group, then the default TACACS+ server group, and finally (as a precaution), **local** authorization:

```
switch(config)# aaa authorization commands default group tg1 tacacs local
All commands will fail if none of the servers in the group list are reachable.
Continue (y/n)? y
```

Defining the Telnet authorization sequence based on a user-defined TACACS+ server group, then the default TACACS+ server group, and finally (as a precaution), **local** authorization:

```
switch(config)# aaa authorization commands telnet group tg1 tacacs local
All commands will fail if none of the servers in the group list are reachable.
Continue (y/n)? y
```

Defining the console authorization sequence based on two user-defined TACACS+ server groups, and finally (as a precaution), **local** authorization:

```
switch(config)# aaa authorization commands console group tg1 tg2 local
All commands will fail if none of the servers in the group list are reachable.
Continue (y/n)? y
```

Setting the authorization for default to **local**:

```
switch(config)# aaa authorization commands default local
```

Setting the authorization for the SSH interface to **none**:

```
switch(config)# aaa authorization commands ssh none
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08.0001 | Added the **telnet** parameter for the 6200, 6300, 6400 Switch Series. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## aaa group server

```
aaa group server {tacacs | radius} <SERVER-GROUP-NAME>
no aaa group server {tacacs | radius} <SERVER-GROUP-NAME>
```

### Description

Creates an AAA server group that is either empty or contains preconfigured RADIUS/TACACS+ servers. You can create a maximum of 28 server groups.

The **no** form of this command deletes a server group. Only a preconfigured user-defined RADIUS/TACACS+ server group can be deleted. RADIUS or TACACS+ servers that were in a deleted server group remain a part of their default server group. The default server group for TACACS+ servers is **tacacs**. The default server group for RADIUS servers is **radius**.

| Parameter | Description |
|---|---|
| `server {tacacs | radius}` | Select either **tacacs** or **radius** for the server type. |
| *<SERVER-GROUP-NAME>* | Specifies the name of the server group to be created. The name of the server group can have a maximum of 32 characters. |

### Examples

Creating TACACS+ server group sg1:

```
switch(config)# aaa group server tacacs sg1
```

Creating RADIUS server group sg3:

```
switch(config)# aaa group server radius sg3
```

Deleting TACACS+ server group sg1:

```
switch(config)# no aaa group server tacacs sg1
```

Deleting RADIUS server group sg3:

```
switch(config)# no aaa group server radius sg3
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server auth-type

```
radius-server auth-type {pap | chap}
no radius-server auth-type {pap | chap}
```

### Description

Enables the CHAP or PAP authentication protocol, which is used for communication with the RADIUS servers, at the global level. You can override this command with a fine-grained per server **auth-type** configuration.

The **no** form of this command resets the global authentication mechanism for RADIUS to PAP or CHAP. PAP is the default authentication mechanism for RADIUS.

| Parameter | Description |
|---|---|
| `auth-type {pap | chap}` | Selects either the PAP or CHAP authentication protocol. |

### Examples

Authenticating CHAP:

```
switch(config)# radius-server auth-type chap
```

Authenticating PAP:

```
switch(config)# radius-server auth-type pap
```

Removing CHAP authentication:

```
switch(config)# no radius-server auth-type chap
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server host

```
radius-server host {<FQDN> | <IPV4> | <IPV6>}
   [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
   [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
   [auth-type {pap | chap}] [acct-port <ACCT-PORT>] [retries <RETRY-COUNT>]
   [tracking {enable | disable}] [tracking-mode {any | dead-only}][vrf <VRF-NAME>]
no radius-server host {<FQDN> | <IPV4> | <IPV6>}
   [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
   [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
   [auth-type {pap | chap}] [acct-port <ACCT-PORT>] [retries <RETRY-COUNT>]
   [tracking {enable | disable}] [tracking-mode {any | dead-only}][vrf <VRF-NAME>]
```

### Description

Adds a RADIUS server. By default, the RADIUS server is associated with the server group named **radius**.

The **no** form of this command removes a previously added RADIUS server.

For enhanced security with IPsec, the alternative command **radius-server host secure ipsec** is available. The standard non-IPsec **radius-server host** command does not modify any existing IPsec configuration. If IPsec is already configured for the RADIUS server, then IPsec will remain enabled for the server.

| Parameter | Description |
|---|---|
| `{<FQDN> \| <IPV4> \| <IPv6>}` | Specifies the RADIUS server as: |

| Parameter | Description |
|---|---|
| | ■ *<FQDN>*: a fully qualified domain name.<br>■ *<IPV4>*: an IPv4 address.<br>■ *<IPV6>*: an IPv6 address. |
| `key [plaintext <PASSKEY> \| ciphertext <PASSKEY>]` | Selects either a plaintext or an encrypted local shared-secret passkey for the server. As per RFC 2865, shared-secret can be a mix of alphanumeric and special characters. Plaintext passkeys are between 1 and 32 alphanumeric and special characters.<br>**NOTE:** When **key** is entered without either sub-parameter, plaintext passkey prompting occurs upon pressing Enter. Enter must be pressed immediately after the **key** parameter without entering other parameters. The entered passkey characters are masked with asterisks. When **key** is omitted, the server uses the global passkey. This command requires either the global or local passkey to be set; otherwise the server will not be contacted. Command **radius-server key** is available for setting the global passkey. |
| `timeout <TIMEOUT-SECONDS>` | Specifies the timeout. Range: 1 to 60 seconds. If a timeout is not specified, the value from the global timeout for RADIUS is used. |
| `port <PORT-NUMBER>` | Specifies the authentication port number. Range: 1 to 65535. Default: 1812. |
| `auth-type {pap \| chap}` | Selects either the PAP (the default) or CHAP authentication types. If this parameter is not specified, the RADIUS global default is used. |
| `acct-port <ACCT-PORT>` | Specifies the UDP accounting port number. Range: 1 to 65535. Default: 1813. |
| `retries <RETRY-COUNT>` | Specifies the number of retry attempts for contacting the specified RADIUS server. Range is 0 to 5 attempts. If no retry value is provided, the default value of 1 is used. |
| `tracking {enable \| disable}` | Enables or disables server tracking for the RADIUS server. Tracked servers are probed at the start of each server tracking interval to check if they are reachable.<br>Use command **radius-server tracking** to configure RADIUS server tracking globally.<br>**NOTE:** Server tracking uses authentication request and response packets to determine server reachability status. The server tracking user name and password are used to form the request packet which is sent to the server with tracking enabled. Upon receiving a response to the request packet, the server is considered to be reachable. |
| `tracking-mode {any \| dead-only}` | Configures tracking mode for the RADIUS server that has tracking enabled with the server. The tracking mode is used to monitor the status of RADIUS server reachability The default tracking mode is **any**.<br>**any**<br>Track the RADIUS server irrespective of its server reachability.<br>**dead-only** |

| Parameter | Description |
|---|---|
| | Track the RADIUS server only when the server is marked as unreachable. |
| `vrf <VRF-NAME>` | Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named **default** is used. |

## Usage

If the fully qualified domain name is provided for the RADIUS server, a DNS server must be configured and accessible through the same VRF which is configured for the RADIUS server. This configuration is required for the resolution of the RADIUS server hostname to its IP address. If a DNS server is not available for this VRF, the RADIUS servers reachable through this VRF must be configured by means of their IP addresses only.

## Examples

Adding a RADIUS server with an IPv4 address and a prompted passkey:

```
switch(config)# radius-server host 1.1.1.5 key
Enter the RADIUS server key: *********
Re-Enter the RADIUS server key: *********
```

Deleting a RADIUS server with an IPv4 address and a prompted passkey:

```
switch(config)# no radius-server host 1.1.1.5 key
Enter the RADIUS server key: *********
Re-Enter the RADIUS server key: *********
```

Adding a RADIUS server with an IPv4 address and a named VRF:

```
switch(config)# radius-server host 1.1.1.1 vrf mgmt
```

Deleting a RADIUS server with an IPv4 address and a named VRF:

```
switch(config)# no radius-server host 1.1.1.1 vrf mgmt
```

Adding a RADIUS server with an IPv4 address, a port, and a named VRF:

```
switch(config)# radius-server host 1.1.1.2 port 32 vrf mgmt
```

Deleting a RADIUS server with an IPv4 address, a port, and a named VRF:

```
switch(config)# no radius-server host 1.1.1.2 port 32 vrf mgmt
```

Adding a RADIUS server with an FQDN, a timeout, port number, and a named VRF:

```
switch(config)# radius-server host abc.com timeout 15 port 32 vrf vrf_blue
```

Deleting a RADIUS server with an FQDN, a timeout, port number, and a named VRF:

```
switch(config)# no radius-server host abc.com timeout 15 port 32 vrf vrf_blue
```

Adding a RADIUS server with an IPv6 address:

```
switch(config)# radius-server host 2001:0db8:85a3:0000:0000:8a2e:0370:7334
```

Deleting a RADIUS server with an IPv6 address:

```
switch(config)# no radius-server host 2001:0db8:85a3:0000:0000:8a2e:0370:7334
```

Adding a RADIUS server with tracking enabled and tracking mode is set to dead-only:

```
switch(config)# radius-server host 1.1.1.1 tracking enable tracking-mode dead-only
```

Deleting a RADIUS server with tracking enabled and tracking mode is set to dead-only:

```
switch(config)# no radius-server host 1.1.1.1 tracking enable tracking-mode dead-
only
```

Adding a RADIUS server with tracking disabled:

```
switch(config)# radius-server host 1.1.1.1 tracking disable
```

Deleting a RADIUS server with tracking disabled:

```
switch(config)# no radius-server host 1.1.1.1 tracking disable
```

Adding a RADIUS server with an IPv4 address, key, encrypted passkey, number of retries, and VRF name:

```
switch(config)# radius-server host 1.1.1.6 key ciphertext AQBapStbgHt1X2JlbcEcQl
xbbzWjrFr9UsfH3+00x5Qj0qcQBAAAAJ5WZBQ= retries 3 vrf vrf_red
```

Deleting a RADIUS server with an IPv4 address, key, encrypted passkey, number of retries, and VRF name:

```
switch(config)# no radius-server host 1.1.1.6 key ciphertext
AQBapStbgHt1X2JlbcEcQl
xbbzWjrFr9UsfH3+00x5Qj0qcQBAAAAJ5WZBQ= retries 3 vrf vrf_red
```

Deleting a RADIUS server with an IPv4 address and specified VRF:

```
switch(config)# no radius-server host 1.1.1.1 vrf mgmt
```

Deleting a RADIUS server with an FQDN, port, and specified VRF:

```
switch(config)# no radius-server host abc.com port 32 vrf vrf_blue
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server host (ClearPass)

```
radius-server host {<FQDN> | <IPV4> | <IPV6>} clearpass-username <CP-USERNAME>
   clearpass-password [plaintext <PLAINTEXT-PASSWORD> | ciphertext <CIPHERTEXT-PASSWORD>]
```

### Description

Configures the ClearPass username and password for a radius server.

| Parameter | Description |
|---|---|
| `{<FQDN> \| <IPV4> \| <IPv6>}` | Specifies the RADIUS server as:<br>■ *<FQDN>*: a fully qualified domain name.<br>■ *<IPV4>*: an IPv4 address.<br>■ *<IPV6>*: an IPv6 address. |
| `clearpass-username <CP-USERNAME>` | Specifies the ClearPass username. |
| `clearpass-password plaintext <PLAINTEXT-PASSWORD>` | Specifies the password as plaintext. The password is visible as cleartext when entered but is encrypted thereafter. Command history does show the password as cleartext. |
| `clearpass-password ciphertext <CIPHERTEXT-PASSWORD>` | Specifies the password as Base64 ciphertext.<br>**NOTE:** When **clearpass-password** is entered without a following sub-parameter, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks. |

### Examples

Configuring a ClearPass username and password for a radius server with a plaintext password:

```
switch(config)# radius-server host 1.1.1.2 clearpass-username admn1
   clearpass-password plaintext uni@#1
```

Configuring a ClearPass username and password for a radius server with a prompted plaintext password:

```
switch(config)# radius-server host 1.1.1.3 clearpass-username op clearpass-
password
Enter the ClearPass server password: *********
Re-Enter the ClearPass server password: *********
```

Configuring a ClearPass username and password for a radius server with a ciphertext password:

```
switch(config)# radius-server host 1.1.1.4 clearpass-username bx clearpass-
password
   ciphertext AQBpXz13c1U1Jt7KMjAIOgjE/lPDfgrYxT6SCi+Di2B+CAAAOnPZmUvMVpq
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# radius-server host secure ipsec

Syntax for a RADIUS server that uses IPsec for authentication:

```
radius-server host {<FQDN> | <IPV4> | <IPV6>}
   [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
   [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
   [auth-type {pap | chap}] [acct-port <ACCT-PORT>] [retries <RETRY-COUNT>]
   [tracking {enable | disable}] [tracking-mode {any | dead-only}] [vrf <VRF-NAME>]
   secure ipsec authentication spi <SPI-INDEX> <AUTH-TYPE> <AUTH-KEY-TYPE> [<AUTH-KEY>]
no radius-server host {<FQDN> | <IPV4> | <IPV6>}
   [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
   [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
   [auth-type {pap | chap}] [acct-port <ACCT-PORT>] [retries <RETRY-COUNT>]
   [tracking {enable | disable}] [tracking-mode {any | dead-only}] [vrf <VRF-NAME>]
   secure ipsec authentication spi <SPI-INDEX><AUTH-TYPE><AUTH-KEY-TYPE> [<AUTH-KEY>]
```

Syntax for a RADIUS server that uses IPsec for both authentication and encryption:

```
radius-server host {<FQDN> | <IPV4> | <IPV6>}
   [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
   [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
   [auth-type {pap | chap}] [acct-port <ACCT-PORT>] [retries <RETRY-COUNT>]
   [tracking {enable | disable}] [tracking-mode {any | dead-only}] [vrf <VRF-NAME>]
   secure ipsec encryption spi <SPI-INDEX> <AUTH-TYPE> <AUTH-KEY-TYPE>
   [<AUTH-KEY>] <ENCRYPT-TYPE> <ENCRYPT-KEY-TYPE> [<ENCRYPT-KEY>]
no radius-server host {<FQDN> | <IPV4> | <IPV6>}
   [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
   [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
   [auth-type {pap | chap}] [acct-port <ACCT-PORT>] [retries <RETRY-COUNT>]
   [tracking {enable | disable}] [tracking-mode {any | dead-only}] [vrf <VRF-NAME>]
   secure ipsec encryption spi <SPI-INDEX><AUTH-TYPE><AUTH-KEY-TYPE>
   [<AUTH-KEY>] <ENCRYPT-TYPE><ENCRYPT-KEY-TYPE> [<ENCRYPT-KEY>]
```

## Description

Adds a RADIUS server that uses IPsec for enhanced security (authentication and possibly encryption). By default, the RADIUS server is associated with the server group named **radius**.

The **no** form of this command removes a previously added RADIUS (with IPsec) server.

Unless enhanced security with IPsec is required, use the **radius-server host** command instead.

| Parameter | Description |
|---|---|
| `{<FQDN> \| <IPV4> \| <IPv6>}` | Specifies the RADIUS server as:<br>- *<FQDN>*: a fully qualified domain name.<br>- *<IPV4>*: an IPv4 address.<br>- *<IPV6>*: an IPv6 address. |
| `key [plaintext <PASSKEY> \| ciphertext <PASSKEY>]` | Selects either a plaintext or an encrypted local shared-secret passkey for the server. As per RFC 2865, shared-secret can be a mix of alphanumeric and special characters. Plaintext passkeys are between 1 and 32 alphanumeric and special characters.<br>**NOTE:** When **key** is entered without either sub-parameter, plaintext passkey prompting occurs upon pressing Enter. Enter must be pressed immediately after the **key** parameter without entering other parameters. The entered passkey characters are masked with asterisks. When **key** is omitted, the server uses the global passkey. This command requires either the global or local passkey to be set; otherwise the server will not be contacted. Command **radius-server key** is available for setting the global passkey. |
| `timeout <TIMEOUT-SECONDS>` | Specifies the timeout. Range: 1 to 60 seconds. If a timeout is not specified, the value from the global timeout for RADIUS is used. |
| `port <PORT-NUMBER>` | Specifies the authentication port number. Range: 1 to 65535. Default: 1812. |
| `auth-type {pap \| chap}` | Selects either the PAP (the default) or CHAP authentication types. If this parameter is not specified, the RADIUS global default is used. |

| Parameter | Description |
|---|---|
| `acct-port <ACCT-PORT>` | Specifies the UDP accounting port number. Range: 1 to 65535. Default: 1813. |
| `retries <RETRY-COUNT>` | Specifies the number of retry attempts for contacting the specified RADIUS server. Range is 0 to 5 attempts. If no retry value is provided, the default value of 1 is used. |
| `tracking {enable \| disable}` | Enables or disables server tracking for the RADIUS server. Tracked servers are probed at the start of each server tracking interval to check if they are reachable.<br>Use command **radius-server tracking** to configure RADIUS server tracking globally.<br>**NOTE:** Server tracking uses authentication request and response packets to determine server reachability status. The server tracking user name and password are used to form the request packet which is sent to the server with tracking enabled. Upon receiving a response to the request packet, the server is considered to be reachable. |
| `tracking-mode {any \| dead-only}` | Configures tracking mode for the RADIUS server that has tracking enabled with the server. The tracking mode is used to monitor the status of RADIUS server reachability The default tracking mode is **any**.<br>**any**<br>Track the RADIUS server irrespective of its server reachability.<br>**dead-only**<br>Track the RADIUS server only when the server is marked as unreachable. |
| `vrf <VRF-NAME>` | Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named **default** is used. |
| `spi <SPI-INDEX>` | Specifies the Security Parameters Index. The SPI is an identification tag carried in the IPsec AH header. The SPI must be unique on the switch. Range: 256 to 4294967295. |
| *<AUTH-TYPE>* | Specifies the authentication algorithm: **md5**, **sha1**, or **sha256**. |
| *<AUTH-KEY-TYPE>* | Specifies the authentication key type: **plaintext**, **hex-string**, or **ciphertext**. |
| [*<AUTH-KEY>*] | Specifies the authentication key. For *<AUTH-TYPE>* of **ciphertext**, this is the ciphertext string.<br>For *<AUTH-TYPE>* of **plaintext** or **hex-string**:<br>▪ **md5 (plaintext)**: 1 to 16 characters, **(hex-string)**: 2 to 32 hexadecimal digits.<br>▪ **sha1 (plaintext)**: 1 to 20 characters, **(hex-string)**: 2 to 40 hexadecimal digits.<br>▪ **sha256 (plaintext)**: 1 to 32 characters, **(hex-string)**: 2 to 64 hexadecimal digits.<br>**NOTE:** When **<AUTH-KEY-TYPE>** is not followed by **<AUTH-KEY>**, plaintext authentication key prompting occurs upon pressing |

| Parameter | Description |
|---|---|
|  | Enter. Enter must be pressed immediately after the **<AUTH-KEY-TYPE>** parameter without entering other parameters. The entered authentication key characters are masked with asterisks. |
| *<ENCRYPT-TYPE>* | Specifies the encryption algorithm: **3des**, **aes**, **des**, or **null**. |
| *<ENCRYPT-KEY-TYPE>* | Specifies the encryption key type: **plaintext**, **hex-string**, or **ciphertext**. |
| [*<ENCRYPT-KEY>*] | Specifies the encryption key. For *<ENCRYPT-TYPE>* of **ciphertext**, this is the ciphertext string.<br>For *<ENCRYPT-TYPE>* of **plaintext** or **hex-string**:<br>■ **3des (plaintext)**: 24 characters, **(hex-string)**: 48 hexadecimal digits.<br>■ **aes (plaintext)**: 16, 24, or 32 characters, **(hex-string)**: 32, 48, or 64 hexadecimal digits.<br>■ **des (plaintext)**: 8 characters, **(hex-string)**: 16 hexadecimal digits.<br>**NOTE:** When **<ENCRYPT-KEY-TYPE>** is not followed by **<ENCRYPT-KEY>**, plaintext encryption key prompting occurs upon pressing Enter. Enter must be pressed immediately after the **<ENCRYPT-KEY-TYPE>** parameter without entering other parameters. The entered encryption key characters are masked with asterisks. |

## Usage

If the fully qualified domain name is provided for the RADIUS server host, a DNS server must be configured and accessible through the same VRF as mentioned for the server host. This configuration is required for the resolution of the RADIUS server hostname to its IP address. If a DNS server is not available for this VRF, the RADIUS servers reachable through this VRF must be configured by means of their IP addresses only.

## Examples

Adding a RADIUS server with an IPv4 address, a plaintext passkey, and IPsec authentication (md5 plaintext).

```
switch(config)# radius-server host 1.1.1.1 key plaintext 98ab vrf mgmt secure
   ipsec authentication spi 261 md5 plaintext 1abc
```

Deleting a RADIUS server with an IPv4 address, a plaintext passkey, and IPsec authentication (md5 plaintext).

```
switch(config)# no radius-server host 1.1.1.1 key plaintext 98ab vrf mgmt secure
   ipsec authentication spi 261 md5 plaintext 1abc
```

Adding a RADIUS server with an IPv4 address and a prompted IPsec authentication (md5) plaintext authentication key.

```
switch(config)# radius-server host 1.1.1.1  secure ipsec authentication spi 261
md5
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********
```

Deleting a RADIUS server with an IPv4 address and a prompted IPsec authentication (md5) plaintext authentication key.

```
switch(config)# no radius-server host 1.1.1.1 secure ipsec authentication spi 261
md5
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********
```

Adding a RADIUS server with an IPv4 address, IPsec authentication (MD5 plaintext), and IPsec encryption (AES plaintext):

```
switch(config)# radius-server host 1.1.1.2 vrf mgmt secure
   ipsec encryption spi 262 md5 plaintext 9xyz aes plaintext 1234567890abcdef
```

Deleting a RADIUS server with an IPv4 address, IPsec authentication (MD5 plaintext), and IPsec encryption (AES plaintext):

```
switch(config)# no radius-server host 1.1.1.2 vrf mgmt secure
   ipsec encryption spi 262 md5 plaintext 9xyz aes plaintext 1234567890abcdef
```

Adding a RADIUS server by providing an IPv4 address and IPsec MD5 authentication type, and then responding to prompts for the keys and encryption type:

```
switch(config)# radius-server host 1.1.1.6 secure ipsec encryption spi 262 md5
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********

Enter the IPsec encryption type (3des/aes/des/null)? aes

Enter the IPsec encryption key: ********
Re-Enter the IPsec encryption key: ********
```

Deleting a RADIUS server by providing an IPv4 address and IPsec MD5 authentication type, and then responding to prompts for the keys and encryption type:

```
switch(config)# no radius-server host 1.1.1.6 secure ipsec encryption spi 262 md5
Enter the IPsec authentication key: ********
Re-Enter the IPsec authentication key: ********

Enter the IPsec encryption type (3des/aes/des/null)? aes

Enter the IPsec encryption key: ********
Re-Enter the IPsec encryption key: ********
```

Adding a RADIUS server with an IPv4 address, tracking enabled, tracking mode, IPsec authentication (MD5 plaintext), IPsec encryption (AES plaintext) is set to dead-only:

```
switch(config)# radius-server host 1.1.1.1 tracking enable tracking-mode dead-only
   vrf mgmt secure ipsec encryption spi 262 md5 plaintext 9xyz
   aes plaintext 1234567890abcdef
```

Deleting a RADIUS server with an IPv4 address, tracking enabled, tracking mode, IPsec authentication (MD5 plaintext), IPsec encryption (AES plaintext) is set to dead-only:

```
switch(config)# no radius-server host 1.1.1.1 tracking enable tracking-mode dead-
only
   vrf mgmt secure ipsec encryption spi 262 md5 plaintext 9xyz
   aes plaintext 1234567890abcdef
```

Removing a RADIUS server:

```
switch(config)# no radius-server host 1.1.1.1 vrf mgmt
```

Removing the ipsec configuration from a RADIUS server:

```
switch(config)# no radius-server host 1.1.1.2 vrf mgmt secure ipsec encryption
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server host tls (RadSec)

```
radius-server host {<FQDN> | <IPV4> | <IPV6>}tls [timeout <TIMEOUT-SECONDS>] [port <PORT-
  NUMBER>][auth-type {pap | chap}] [tracking {enable | disable}] [tracking-mode {any |
dead-
  only}] [vrf <VRF-NAME>]

no radius-server host {<FQDN> | <IPV4> | <IPV6>}tls [timeout <TIMEOUT-SECONDS>] [port
<PORT-
  NUMBER>][auth-type {pap | chap}] [tracking {enable | disable}] [tracking-mode {any |
dead-
  only}] [vrf <VRF-NAME>]
```

### Description

Adds a RadSec server. By default, the RADIUS server is associated with the server group named **radius**. RadSec is used to secure the communication between RADIUS server and RADIUS client using TLS.

The **no** form of this command removes a previously added RadSec server.

The shared key will be added as **radsec** for connection establishment.

| Parameter | Description |
|---|---|
| `{<FQDN> \| <IPV4> \| <IPv6>}` | Specifies the RADIUS server as:<br>■ *<FQDN>*: a fully qualified domain name.<br>■ *<IPV4>*: an IPv4 address.<br>■ *<IPV6>*: an IPv6 address. |
| `tls` | Establishes RADIUS connection over TLS. |
| `timeout <TIMEOUT-SECONDS>` | Specifies the timeout. Range: 1 to 60 seconds. If a timeout is not specified, the value from the global timeout for RADIUS is used. |
| `port <PORT-NUMBER>` | Specifies the authentication port number. Range: 1 to 65535. Default: 1812. |
| `auth-type {pap \| chap}` | Selects either the PAP (the default) or CHAP authentication types. If this parameter is not specified, the RADIUS global default is used. |
| `acct-port <ACCT-PORT>` | Specifies the UDP accounting port number. Range: 1 to 65535. Default: 1813. |
| `tracking {enable \| disable}` | Enables or disables server tracking for the RADIUS server. Tracked servers are probed at the start of each server tracking interval to check if they are reachable.<br>Use command **radius-server tracking** to configure RADIUS server tracking globally.<br><br>**NOTE:** Server tracking uses authentication request and response packets to determine server reachability status. The server tracking user name and password are used to form the request packet which is sent to the server with tracking enabled. Upon receiving a response to the request packet, the server is considered to be reachable. |
| `tracking-mode {any \| dead-only}` | Configures tracking mode for the RADIUS server that has tracking enabled with the server. The tracking mode is used to monitor the status of RADIUS server reachability The default tracking mode is **any**.<br>**any**<br>Track the RADIUS server irrespective of its server reachability.<br>**dead-only**<br>Track the RADIUS server only when the server is marked as unreachable. |
| `vrf <VRF-NAME>` | Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named **default** is used. |

## Examples

Adding a RADIUS server over TLS with an IPv4 address and a named VRF:

```
switch(config)# radius-server host 1.1.1.1 tls vrf mgmt
```

Deleting a RADIUS server over TLS with an IPv4 address and a named VRF:

```
switch(config)# no radius-server host 1.1.1.1 tls vrf mgmt
```

Adding a RADIUS server over TLS with an IPv4 address and default port:

```
switch(config)# radius-server host 1.1.1.1 tls port
```

Deleting a RADIUS server over TLS with an IPv4 address and default port:

```
switch(config)# no radius-server host 1.1.1.1 tls port
```

Adding a RADIUS server over TLS with tracking enabled and tracking mode is set to dead-only:

```
switch(config)# radius-server host 1.1.1.1 tls tracking enable tracking-mode dead-
only
```

Deleting a RADIUS server over TLS with tracking enabled and tracking mode is set to dead-only:

```
switch(config)# no radius-server host 1.1.1.1 tls tracking enable tracking-mode
dead-only
```

Adding a RADIUS server over TLS with an IPv4 address, a port, and a named VRF:

```
switch(config)# radius-server host 1.1.1.2 tls port 32 vrf mgmt
```

Deleting a RADIUS server over TLS with an IPv4 address, a port, and a named VRF:

```
switch(config)# no radius-server host 1.1.1.2 tls port 32 vrf mgmt
```

Adding a RADIUS server over TLS with an IPv6 address:

```
switch(config)# radius-server host 2001:0db8:85a3:0000:0000:8a2e:0370:7334 tls
```

Deleting a RADIUS server over TLS with an IPv6 address:

```
switch(config)# no radius-server host 2001:0db8:85a3:0000:0000:8a2e:0370:7334 tls
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server host tls port-access

```
radius-server host {<FQDN> | <IPV4> | <IPV6>} tls port-access {status-server | keep-
alive}
no radius-server host {<FQDN> | <IPV4> | <IPV6>} tls port-access {status-server | keep-
alive}
```

### Description

Configures the type of messages to be sent inside RadSec sessions for port access authentication. Default message type for port access authentication sessions is `status-server`.

The **no** form of this command removes the message type configured for port access authentication sessions and sets the default, **status-server**.

| Parameter | Description |
|---|---|
| `{<FQDN> \| <IPV4> \| <IPv6>}` | Specifies the RADIUS server as:<br>- *<FQDN>*: a fully qualified domain name.<br>- *<IPV4>*: an IPv4 address.<br>- *<IPV6>*: an IPv6 address. |
| `port-access {status-server \| keep-alive}` | Specifies the message type to be used for port access authentication in RadSec sessions. Following message types are supported:<br>- **status-server:** Sets status server message type for authentication.<br>- **keep-alive:** Sets keep-alive message type for authentication.<br>**NOTE:** Keep-alive as tracking method and for port access sessions is recommended in networks where a RadSec server is connected to more number of RadSec clients. The server requires additional resources to process status-server and access-request messages when compared to keep-alive messages. This is because status-server and access-request messages are RADIUS protocol packets. However, keep-alive packets are TCP control packets that does not require any additional resources for processing by the RadSec server. |

### Examples

Configuring the **keep-alive** messages for port access authentication in RadSec session on host **1.1.1.1**:

```
switch(config)# radius-server host 1.1.1.1 tls port-access keep-alive
```

Deleting the message type configured on host **1.1.1.1** for port access authentication session and setting the method to the default, **status-server**:

```
switch(config)# no radius-server host 1.1.1.1 tls port-access status-server
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server host tls tracking-method

```
radius-server host {<FQDN> | <IPV4> | <IPV6>} tls tracking-method {status-server | keep-
alive | access-request}
no radius-server host {<FQDN> | <IPV4> | <IPV6>} tls tracking-method {status-server |
keep-alive | access-request}
```

### Description

Configures the tracking method to be used for RADIUS server tracking. RADIUS server tracking must be configured for enabling the tracking method. Default tracking method is **access-request**.

The **no** form of this command sets the tracking method to the default option, **access-request**.

| Parameter | Description |
|---|---|
| `{<FQDN> | <IPV4> | <IPv6>}` | Specifies the RADIUS server as:<br>- *<FQDN>*: a fully qualified domain name.<br>- *<IPV4>*: an IPv4 address.<br>- *<IPV6>*: an IPv6 address. |
| `tracking-method {status-server | keep-alive | access-request}` | Specifies the tracking method for RadSec tracking. Following methods are supported:<br>- **status-server:** Status server responses are used to update the reachability status of the RadSec server.<br>- **keep-alive:** Server socket status is verified to update the reachability status of the RadSec server. |

| Parameter | Description |
|---|---|
| | **NOTE: keep-alive** as tracking method and for port access sessions is recommended in networks where a RadSec server is connected to more number of RadSec clients. The server requires additional resources to process **status-server** and **access-request** messages when compared to **keep-alive** messages. This is because **status-server** and **access-request** messages are RADIUS protocol packets. However, **keep-alive packets** are TCP control packets that does not require any additional resources for processing by the RadSec server.<br>■ **access-request:** Access response messages are used to update the reachability status of the RadSec server. |

## Usage

- If the network has a RADIUS proxy, then it is recommended to use the **access-request** tracking method to track the RadSec server.
- If **keep-alive** is the tracking method, then make sure to check whether the server has the capability to treat the **keep-alive** messages sent in RadSec sessions as valid RadSec messages to keep the session active.

## Examples

Configuring the RADIUS server tracking method on host **1.1.1.1**:

```
switch(config)# radius-server host 1.1.1.1 tls tracking-method status-server
```

Deleting the RADIUS server tracking method on host **1.1.1.1** and setting the method to the default, **access-request**:

```
switch(config)# no radius-server host 1.1.1.1 tls tracking-method access-request
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# radius-server key

```
radius-server key [plaintext <GLOBAL-PASSKEY> | ciphertext <GLOBAL-PASSKEY>]
no radius-server key [plaintext <GLOBAL-PASSKEY> | ciphertext <GLOBAL-PASSKEY>]
```

## Description

Creates or modifies a RADIUS global passkey. The RADIUS global passkey is used as a shared-secret for encrypting the communication between all RADIUS servers and the switch. The RADIUS global passkey is required for authentication unless local passkeys have been set. By default, the RADIUS global passkey is empty. If the administrator has not set this key, the switch will not be able to perform RADIUS authentication. The switch will instead rely on the authentication mechanism configured with **aaa authentication login**.

When this command is entered without parameters, plaintext passkey prompting occurs upon pressing Enter. The entered passkey characters are masked with asterisks.

The **no** form of the command removes the global passkey.

| Parameter | Description |
|---|---|
| `plaintext <GLOBAL-PASSKEY>` | Specifies the RADIUS global passkey in plaintext format with a length of 1 to 31 characters. As per RFC 2865, a shared-secret can be a mix of alphanumeric and special characters. |
| `ciphertext <GLOBAL-PASSKEY>` | Specifies the RADIUS global passkey in encrypted format. |

## Examples

Adding the global passkey:

```
switch(config)# radius-server key plaintext mypasskey123
```

Adding the global passkey with prompting:

```
switch(config)# radius-server key
Enter the RADIUS server key: *********
Re-Enter the RADIUS server key: *********
```

Removing the global passkey:

```
switch(config)# no radius-server key
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server retries

```
radius-server retries <0-5>
no radius-server retries <0-5>
```

### Description

Sets at the global level the number of retries the switch makes before concluding that the RADIUS server is unreachable.

You can override this setting with a fine-grained per RADIUS server retries configuration.

The **no** form of this command resets the RADIUS global retries to the default retries value of 1.

| Parameter | Description |
|---|---|
| `retries <0-5>` | Specifies the number of retry attempts for contacting RADIUS servers. Range is 0 to 5 retries. |

### Example

```
switch(config)# radius-server retries 3
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# radius-server status-server interval

```
radius-server status-server interval <10-86400>
no radius-server status-server interval <10-86400>
```

## Description

Configures the time interval in seconds to send the status server requests to the RADIUS server.

The **no** form of this command configures the default time interval, **300** seconds.

| Parameter | Description |
|---|---|
| *<10-86400>* | Specifies the status server time interval in seconds. Default: **300**. |

## Examples

Configuring the status server time interval of 200 seconds:

```
switch(config)# radius-server status-server interval 200
```

Resetting the status server time interval to the default, 300 seconds:

```
switch(config)# no radius-server status-server interval 200
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# radius-server timeout

```
radius-server timeout [<1-60>]
no radius-server timeout [<1-60>]
```

## Description

Specifies the number of seconds to wait for a response from the RADIUS server before trying the next RADIUS server. If a value is not specified, a default value of 5 seconds is used. You can override this value with a fine-grained per server timeout configured for individual servers.

The **no** form of this command resets the RADIUS global authentication timeout to the default of 5 seconds.

| Parameter | Description |
|---|---|
| `timeout <1-60>` | Specifies the timeout interval of 1 to 60 seconds. Default: 5 seconds. |

### Examples

Setting the RADIUS server timeout:

```
switch(config)# radius-server timeout 10
```

Resetting the timeout for the RADIUS server to the default:

```
switch(config)# no radius-server timeout
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server tls timeout (RadSec)

```
radius-server tls timeout [<1-60>]
no radius-server tls timeout [<1-60>]
```

### Description

Specifies the number of seconds to wait for a response from the RadSec server before trying the next RADIUS or RadSec server. If a value is not specified, a default value of 5 seconds is used. You can override this value with a fine-grained per server timeout configured for individual servers.

The **no** form of this command resets the RadSec global authentication timeout to the default of 5 seconds.

| Parameter | Description |
|---|---|
| `timeout <1-60>` | Specifies the timeout interval of 1 to 60 seconds. Default: 5 seconds. |

### Examples

Setting the RadSec server timeout:

```
switch(config)# radius-server tls timeout 10
```

Resetting the timeout for the RadSec to the default:

```
switch(config)# no radius-server tls timeout
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## radius-server tracking

```
radius-server tracking interval <INTERVAL>
no radius-server tracking interval

radius-server tracking retries <RETRIES>
no radius-server tracking retries

radius-server tracking user-name <NAME>
   [password [plaintext <PASSWORD> | ciphertext <PASSWORD>]]
no radius-server tracking user-name <NAME>
   [password [plaintext <PASSWORD> | ciphertext <PASSWORD>]]
```

### Description

Configures RADIUS server tracking settings globally for all configured RADIUS servers that have tracking enabled with the **radius-server host** command on individual servers.

The **no** form of the command removes the specified configuration, reverting it to its default. The no form with **user-name** also clears the password (resets it to empty).

| Parameter | Description |
|---|---|
| `interval <INTERVAL>` | Specifies the time interval, in seconds, to wait before checking the server reachability status. Default: 300. Range 60 to 84600. |
| `retries <RETRIES>` | Specifies the number of server retries. Default: Global RADIUS retries. Range: 0 to 5. |
| `user-name <NAME> [password [plaintext <PASSWORD> \| ciphertext <PASSWORD>]]` | Specifies the user name (and optionally a password) to be used for server checking. The default user name is **radius-tracking-user** with an empty password.<br>The password is optional and may be entered as **plaintext** or pasted in as **ciphertext**. The plaintext password is visible as cleartext when entered but is encrypted thereafter. Command history does show the password as cleartext.<br>**NOTE:** When **password** is entered without a following sub-parameter, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.<br>**NOTE:** The user does not have to be configured on the server. Server tracking can still be performed with a user which is not configured on the server because authentication failure on the server achieves confirmation that the server is reachable.<br>**NOTE:** Server tracking uses authentication request and response packets to determine server reachability status. The server tracking user name and password are used to form the request packet which is sent to the server with tracking enabled. Upon receiving a response to the request packet, the server is considered to be reachable. |

## Examples

Configuring a tracking interval of 120 seconds:

```
switch(config)# radius-server tracking interval 120
```

Reverting the tracking interval to its default of 300 seconds:

```
switch(config)# no radius-server tracking interval
```

Configuring three retries:

```
switch(config)# radius-server tracking retries 3
```

Configuring user **radius-tracker** with a plaintext password.

```
switch(config)# radius-server tracking user-name radius-tracker
    password plaintext track$1
```

Configuring user **radius-tracker** with a prompted plaintext password.

```
switch(config)# radius-server tracking user-name radius-tracker password
Enter the RADIUS server tracking password: *******
Re-Enter the RADIUS server tracking password: *******
```

Reverting the tracking user name to its default of **radius-tracking-user**:

```
switch(config)# no radius-server tracking user-name
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## server

```
server {<FQDN> | <IPV4> | <IPV6>} [tls] [port <PORT-NUMBER>] [vrf <VRF-NAME>]
no server {<FQDN> | <IPV4> | <IPV6>} [tls] [port <PORT-NUMBER>] [vrf <VRF-NAME>]
```

### Description

Adds a TACACS+ or RADIUS server to a server group. Only the configured TACACS+ or RADIUS servers are allowed to be added within the server group. If the same server name exists with multiple ports or multiple VRFs, specify the server name, port, and VRF when adding the server to the server-group.

The **no** form of this command removes a TACACS+/RADIUS server from a server-group.

On the 4100i, 6000, 6100, 6200, 6300, 6400, 8100, 8325, 8360, and 10000 Switch Series, a RADIUS server can be associated with a maximum of four different user-defined server groups.

On the 8320, 8400, and 9300 Switch Series, a RADIUS server can be associated with only one user-defined server group.

| Parameter | Description |
|---|---|
| `{<FQDN> | <IPV4> | <IPv6>}` | Specifies the RADIUS server as:<br>▪ *<FQDN>*: a fully qualified domain name. |

| Parameter | Description |
|---|---|
| | ■ *<IPV4>*: an IPv4 address.<br>■ *<IPV6>*: an IPv6 address. |
| `tls` | Specifies the TLS protection for the RADIUS server.<br>If TLS is configured without a port number, the system searches the RADIUS server by host name and sets the default authentication port (2083). Group server priority is assigned based on the sequence in which the servers are added. |
| `port` *`<PORT-NUMBER>`* | Specifies the authentication port number. Range: 1 to 65535. Default TACACS+ (TCP): 49, RADIUS (UDP): 1812 and RadSec: 2083.<br>If a port number is not provided, the system searches the TACACS+/RADIUS server by host name and sets the default authentication port. Group server priority is assigned based on the sequence in which the servers are added. |
| `vrf` *`<VRF-NAME>`* | Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named **default** is used. |

## Examples

Adding a server to TACACS+ server group sg1 by providing an IPv4 address, port number, and VRF name:

```
switch(config)# aaa group server tacacs sg1
switch(config-sg)# server 1.1.1.2 port 32 vrf default
```

Adding a server to TACACS+ server group sg2 by providing an IPv6 address and default VRF:

```
switch(config)# aaa group server tacacs sg2
switch(config-sg)# server 2001:0db8:85a3:0000:0000:8a2e:0370:7334 vrf default
```

Adding a server to RADIUS server group sg3 by providing an IPv4 address, port number, and VRF name:

```
switch(config)# aaa group server radius sg3
switch(config-sg)# server 1.1.1.5 port 12 vrf default
```

Adding a server to RADIUS server group sg3 with TLS protection by providing an IPv4 address, port number, and VRF name:

```
switch(config)# aaa group server radius sg3
switch(config-sg)# server 1.1.1.5 tls port 12 vrf default
```

Adding a server to RADIUS server group sg4 by providing an IPv6 address and default VRF:

```
switch(config)# aaa group server radius sg4
switch(config-sg)# server 2001:0db8:85a3:0000:0000:8a2e:0371:7334 vrf default
```

Adding a server to RADIUS server group sg4 by providing an IPv4 address, port number, and VRF name:

```
switch(config)# aaa group server radius sg4
switch(config-sg)# server 1.1.1.6 port 32 vrf vrf_red
```

Specifying an IPv4 address when removing a TACACS+ server from server group sg1:

```
switch(config)# aaa group server tacacs sg1
switch(config-sg)# no server 1.1.1.2 port 12 vrf default
```

Specifying an IPv6 address when removing a TACACS+ server from server group sg2 with the default VRF:

```
switch(config)# aaa group server tacacs sg2
switch(config-sg)# no server 2001:0db8:85a3:0000:0000:8a2e:0370:7334 vrf default
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-sg` | Administrators or local user group members with execution rights for this command. |

## show aaa accounting

`show aaa accounting [vsx-peer]`

### Description

Shows the accounting configuration per connection type (channel).

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Configuring and then showing the accounting sequence for TACACS+ groups and local:

```
(config)# aaa accounting all-mgmt default start-stop group sg1 tacacs radius
(config)# aaa accounting all-mgmt console start-stop local
(config)# aaa accounting all-mgmt ssh start-stop group radius tacacs local
(config)# aaa accounting all-mgmt https-server start-stop group sg1 tacacs
(config)# aaa accounting all-mgmt telnet start-stop group radius tacacs local
(config)# show aaa accounting
AAA Accounting:
Accounting Type              : all
Accounting Mode              : start-stop
Accounting Failthrough       : Enabled

Accounting for https-server channel:
--------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
sg1                              | 0
tacacs                           | 1
--------------------------------------------------------------------------------
Accounting for console channel:
--------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
local                            | 0
--------------------------------------------------------------------------------
Accounting for default channel:
--------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
sg1                              | 0
tacacs                           | 1
radius                           | 2
--------------------------------------------------------------------------------
Accounting for ssh channel:
--------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
radius                           | 0
tacacs                           | 1
local                            | 2
--------------------------------------------------------------------------------
Accounting for telnet channel:
--------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
radius                           | 0
tacacs                           | 1
local                            | 2
--------------------------------------------------------------------------------
```

Configuring and then showing the accounting sequence for RADIUS groups and local:

```
switch(config)# aaa accounting all default start-stop group rg1 rg2 radius local
switch(config)# aaa accounting all console start-stop group rg4 radius local
switch(config)# exit
switch# show aaa accounting
AAA Accounting:
Accounting Type                              : all
Accounting Mode                              : start-stop
Accounting Failthrough                       : Enabled
Accounting for default channel:
---------------------------------------------------------------------------------
```

```
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
rg1                              | 0
rg2                              | 1
radius                           | 2
local                            | 3
--------------------------------------------------------------------------------
Accounting for console channel:
--------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
tg4                              | 0
radius                           | 1
local                            | 2
--------------------------------------------------------------------------------
```

Configuring and then showing only local accounting for default:

```
switch(config)# aaa accounting all default start-stop local
switch(config)# exit
switch# show aaa accounting
AAA Accounting:
Accounting Type                                       : all
Accounting Mode                                       : start-stop
Accounting for default channel:
--------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
--------------------------------------------------------------------------------
local                            | 0
--------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show aaa accounting port-access (RADIUS only)

```
show aaa accounting port-access [interface {<IF-NAME> | all}
     client-status [mac <MAC-ADDR>]] [vsx-peer]
```

### Description

Shows overall or specific port access accounting information.

| Parameter | Description |
|---|---|
| `interface {<IF-NAME> \| all}` | Selects either one interface or all interfaces for showing. |
| `mac <MAC-ADDR>` | Specifies a client station MAC address (xx:xx:xx:xx:xx:xx), where x is a hexadecimal number from 0 to F. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing the overall port access accounting information:

```
switch# show aaa accounting port-access

AAA Accounting Port Access
===========================
  Radius Accounting Enabled      : yes
  Radius Server Group            : acct_group
  Local Accounting Enabled       : no
  Accounting Mode                : start-stop
  Interim Update Enabled         : yes
  Interim Interval               : 12 minutes
```

Showing the port access accounting information for a client.

```
switch# show aaa accounting port-access interface 1/1/1 client-status

Port Access Client Status Details

Client a6:4f:1e:6a:3d:2c, test1
============================
  Session Details
  ---------------
    Port                 : 1/1/1
    Session Time         : 100s

  Accounting Details
  ------------------
    Accounting Session ID  : 1234
    Input Packets          : 1028
    Input Octets           : 8224
    Output Packets         : 2048
    Output Octets          : 8000
    Input Gigaword         : 0
    Output Gigaword        : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.04 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show aaa authentication

```
show aaa authentication [vsx-peer]
```

### Description

Shows the authentication configuration per connection type (channel).

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Configuring TACACS+ authentication sequences and then showing the configuration per connection type (channel):

```
switch(config)# aaa authentication login default group sg1 sg2 sg3 sg4 tacacs
local
switch(config)# aaa authentication login ssh group sg1 sg2
switch(config)# aaa authentication login console group sg4 tacacs local
switch(config)# aaa authentication login https-server local group tacacs sg3
switch(config)# aaa authentication login telnet group sg1 sg2
switch(config)# exit

switch# show aaa authentication
AAA Authentication:
  Fail-through               : Enabled
  Limit Login Attempts       : Not set
  Lockout Time               : 300
  Minimum Password Length    : Not set

Authentication for ssh channel:
----------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
----------------------------------------------------------------------------------
sg1                               | 0
sg2                               | 1
----------------------------------------------------------------------------------

Authentication for https-server channel:
```

```
----------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
----------------------------------------------------------------------------------
local                             | 0
tacacs                            | 1
sg3                               | 2
----------------------------------------------------------------------------------

Authentication for console channel:
----------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
----------------------------------------------------------------------------------
sg4                               | 0
tacacs                            | 1
local                             | 2
----------------------------------------------------------------------------------

Authentication for default channel:
----------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
----------------------------------------------------------------------------------
sg1                               | 0
sg2                               | 1
sg3                               | 2
sg4                               | 3
tacacs                            | 4
local                             | 5
----------------------------------------------------------------------------------
Authentication for telnet channel:
----------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
----------------------------------------------------------------------------------
sg1                               | 0
sg2                               | 1
----------------------------------------------------------------------------------
```

Configuring RADIUS authentication sequences and then showing the configuration per connection type (channel):

```
switch(config)# aaa authentication login default group rg1 rg2 rg3 rg4 radius
local
switch(config)# aaa authentication login console group rg4 radius local
switch(config)# exit
switch# show aaa authentication
AAA Authentication:
  Fail-through                : Enabled
  Limit Login Attempts        : Not set
  Lockout Time                : 300
  Minimum Password Length     : Not set

Authentication for default channel:
---------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
---------------------------------------------------------------------------------
rg1                               | 0
rg2                               | 1
rg3                               | 2
rg4                               | 3
radius                            | 4
local                             | 5
---------------------------------------------------------------------------------
```

```
Authentication for console channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
rg4                              | 0
radius                           | 1
local                            | 2
---------------------------------------------------------------------------------
```

Configuring only default authentication and then showing the default connection type (channel):

```
switch(config)# aaa authentication login default local
switch(config)# exit
switch# show aaa authentication

AAA Authentication:
  Fail-through                            : Disabled
  Limit Login Attempts                    : Not set
  Lockout Time                            : 300
  Minimum Password Length                 : Not set

Authentication for default channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show aaa authorization

```
show aaa authorization [vsx-peer]
```

## Description

Shows the authorization configuration per connection type (channel).

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Configuring and then showing the authorization sequence for default and console connection types (channels):

```
(config)# aaa authorization commands default group sg1 tacacs local
All commands will fail if none of the servers in the group list are reachable.
Continue (y/n)? y
(config)# aaa authorization commands ssh group sg2
All commands will fail if none of the servers in the group list are reachable.
Continue (y/n)? y
(config)# aaa authorization commands telnet group sg2
All commands will fail if none of the servers in the group list are reachable.
Continue (y/n)? y
(config)# aaa authorization commands console group sg1 local
All commands will fail if none of the servers in the group list are reachable.
Continue (y/n)? y
(config)# aaa authorization radius ssh group sg1
All commands will fail if none of the radsec servers in the group list are
reachable.
Continue (y/n)? y
(config)# aaa authorization radius https-server group sg2
All commands will fail if none of the radsec servers in the group list are
reachable.
Continue (y/n)? y


(config)# show aaa authorization

******* Command authorization *******
Authorization for console channel:
---------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
---------------------------------------------------------------------------------
sg1                               | 0
local                             | 1
---------------------------------------------------------------------------------

Authorization for default channel:
---------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
---------------------------------------------------------------------------------
sg1                               | 0
tacacs                            | 1
local                             | 2
---------------------------------------------------------------------------------

Authorization for ssh channel:
---------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
---------------------------------------------------------------------------------
sg2                               | 0
---------------------------------------------------------------------------------
```

```
Authorization for telnet channel:
--------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
--------------------------------------------------------------------------------
sg2                               | 0
--------------------------------------------------------------------------------

******* User authorization through radius *******
Authorization for ssh channel:
--------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
--------------------------------------------------------------------------------
sg1                               | 0
--------------------------------------------------------------------------------

Authorization for https-server channel:
--------------------------------------------------------------------------------
GROUP NAME                        | GROUP PRIORITY
--------------------------------------------------------------------------------
sg2                               | 0
--------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show aaa server-groups

```
show aaa server-groups [tacacs | radius] [vsx-peer]
```

### Description

Shows TACACS+ and RADIUS AAA server group information for all server types or for the specified server type.

| Parameter | Description |
|---|---|
| `tacacs` | Narrows the command output to only TACACS+ servers. |
| `radius` | Narrows the command output to only RADIUS servers. |

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Showing all AAA server group information:

```
switch# show aaa server-groups

******* AAA Mechanism TACACS+ *******
---------------------------------------------------------------------------------
GROUP NAME       | SERVER NAME                        | PORT | VRF     | PRIORITY
---------------------------------------------------------------------------------
sg2              | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 49   | default | 1
---------------------------------------------------------------------------------
sg1              | 1.1.1.2                            | 12   | mgmt    | 1
---------------------------------------------------------------------------------
tacacs (default) | FQDN.com                           | 32   | mgmt    | 1
tacacs (default) | 1.1.1.1                            | 49   | mgmt    | 2
tacacs (default) | 1.1.1.2                            | 12   | mgmt    | 3
tacacs (default) | abc.com                            | 32   | vrf_red | 4
tacacs (default) | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 49   | default | 5
tacacs (default) | 1.1.1.3                            | 32   | vrf_blue| 6
---------------------------------------------------------------------------------
******* AAA Mechanism RADIUS *******
---------------------------------------------------------------------------------
GROUP NAME       | SERVER NAME                        | PORT | VRF     | PRIORITY
---------------------------------------------------------------------------------
sg4              | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 1812 | default | 1
---------------------------------------------------------------------------------
sg3              | 1.1.1.5                            | 12   | mgmt    | 1
---------------------------------------------------------------------------------
radius (default) | 1.1.1.4                            | 1812 | mgmt    | 1
radius (default) | 1.1.1.5                            | 12   | mgmt    | 2
radius (default) | abc1.com                           | 32   | mgmt    | 3
radius (default) | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 1812 | default | 4
radius (default) | 1.1.1.6                            | 32   | vrf_red | 5
radius (default) | 1.1.1.7                            | 32   | vrf_blue| 6
---------------------------------------------------------------------------------
```

Showing TACACS+ server group information:

```
switch# show aaa server-groups tacacs

******* AAA Mechanism TACACS+ *******
---------------------------------------------------------------------------------
GROUP NAME       | SERVER NAME                        | PORT | VRF     | PRIORITY
---------------------------------------------------------------------------------
sg2              | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 49   | default | 1
---------------------------------------------------------------------------------
sg1              | 1.1.1.2                            | 12   | mgmt    | 1
```

```
---------------------------------------------------------------------------------
tacacs (default) | FQDN.com                           | 32   | mgmt    | 1
tacacs (default) | 1.1.1.1                            | 49   | mgmt    | 2
tacacs (default) | 1.1.1.2                            | 12   | mgmt    | 3
tacacs (default) | abc.com                            | 32   | vrf_red | 4
tacacs (default) | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 49   | default | 5
tacacs (default) | 1.1.1.3                            | 32   | vrf_blue| 6
---------------------------------------------------------------------------------
```

Showing RADIUS server group information:

```
switch# show aaa server-groups radius

******* AAA Mechanism RADIUS *******
---------------------------------------------------------------------------------
GROUP NAME       | SERVER NAME                        | PORT | VRF     | PRIORITY
---------------------------------------------------------------------------------
sg4              | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 1812 | default | 1
---------------------------------------------------------------------------------
sg3              | 1.1.1.5                            | 12   | mgmt    | 1
---------------------------------------------------------------------------------
radius (default) | 1.1.1.4                            | 1812 | mgmt    | 1
radius (default) | 1.1.1.5                            | 12   | mgmt    | 2
radius (default) | abc1.com                           | 32   | mgmt    | 3
radius (default) | 2001:0db8:85a3:0000:0000:8a2e:
                   0370:7334                          | 1812 | default | 4
radius (default) | 1.1.1.6                            | 32   | vrf_red | 5
radius (default) | 1.1.1.7                            | 32   | vrf_blue| 6
---------------------------------------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show accounting log

```
show accounting log [last <QTY-TO-SHOW> | all]
```

### Description

Entered without optional parameters, this command shows all accounting log records for the current boot. Sensitive information is masked from the log, by being represented as asterisks.

This **show accounting log** command replaces the **show audit-log** command that is supported only in 10.00 releases.

| Parameter | Description |
|---|---|
| `last <QTY-TO-SHOW>` | Specifies how many most-recent accounting log records to show for the current boot. Range: 1 to 1000. |
| `all` | Selects for showing, all accounting records from the current boot and the previous boot. |

## Usage

The log message starts with the record type, which is specific to AOS-CX. Values are the following:

`USER_START`

Record of a user login action.

`USER_END`

Record of a user logout action.

`USYS_CONFIG`

Record of a command executed by the user.

The three types of accounting log information are identified by the **msg=** element starting with the **rec=** item as follows:

- Exec is identified with: **msg='rec=ACCT_EXEC**
- Command is identified with: **msg='rec=ACCT_CMD**
- System is identified with: **msg='rec=ACCT_SYSTEM**

The user group is indicated by **priv-lvl**, which is specific to AOS-CX. Values are the following:

| Privilege level | User group |
|---|---|
| 1 | **operators** |
| 15 | **administrators** |
| 19 | **auditors** |

The value of **service** indicates which user interface was used:

`service=shell`

Indicates that the log entry is a result of a CLI command.

`service=https-server`

Indicates that the log entry is a result of a REST API request or a Web UI action.

The string value of **data** identifies the CLI command or REST API request that was executed.

These elements are shown in context under *Examples*.

## Examples

Showing the accounting log for the previous and current boot. Line breaks have been added for readability.

```
switch# show accounting log all

---------------------------------------------------------------------------------
Local accounting logs from previous boot
---------------------------------------------------------------------------------
----
type=DAEMON_START msg=audit(Nov 05 2018  23:00:58.607:9057) :
auditd start, ver=2.4.3 format=raw kernel=4.9.119-yocto-standard res=success
----
type=USER_START msg=audit(Nov 05 2018  23:06:42.398:42) :
msg='rec=ACCT_EXEC op=start session=CONSOLE timezone=UTC user=user1 priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=no
hostname=8xxx addr=0.0.0.0 res=success'
----
type=USYS_CONFIG msg=audit(Nov 05 2018  23:06:42.399:43) :
msg='rec=ACCT_CMD op=stop session=CONSOLE timezone=UTC user=user1 priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=no
data="enable" hostname=8xxx addr=0.0.0.0 res=success'
----
type=USYS_CONFIG msg=audit(Nov 05 2018  23:08:24.693:51) :
msg='rec=ACCT_CMD op=stop session=CONSOLE timezone=UTC user=user1 priv-lvl=1
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=no
data="configure terminal" hostname=8xxx addr=0.0.0.0 res=success'
----
type=USYS_CONFIG msg=audit(Nov 05 2018  23:08:39.108:52) :
msg='rec=ACCT_CMD op=stop session=CONSOLE timezone=UTC user=user1 priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=yes
data="https-server rest access-mode read-write"
hostname=8xxx addr=0.0.0.0 res=success'
----
type=USER_START msg=audit(Nov 05 2018  23:10:57.238:58) :
msg='rec=ACCT_EXEC op=start session=REST timezone=UTC user=admin priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=https-server
data="http-method=POST http-uri=/rest/v1/login"
hostname=8xxx addr=127.0.0.1 res=success'
----
type=USYS_CONFIG msg=audit(Nov 05 2018  23:15:11.958:75) :
msg='rec=ACCT_CMD op=stop session=CONSOLE timezone=UTC user=user1 priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=yes
data="tacacs-server host 2.2.2.2" hostname=8xxx addr=0.0.0.0 res=success'
----
type=USYS_CONFIG msg=audit(Nov 05 2018  23:15:37.090:76) :
msg='rec=ACCT_CMD op=stop session=REST timezone=UTC user=admin priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=https-server
data="http-method=GET http-uri=/rest/v1/system/vrfs/mgmt/tacacs_servers"
hostname=8xxx addr=127.0.0.1 res=success'
----
type=USER_END msg=audit(Nov 05 2018  23:26:59.207:90) :
msg='rec=ACCT_EXEC op=stop session=REST timezone=UTC user=admin priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=https-server
data="http-method=POST http-uri=/rest/v1/logout"
hostname=8xxx addr=127.0.0.1 res=success'
----
type=USER_END msg=audit(Nov 05 2018  23:27:49.164:93) :
msg='rec=ACCT_EXEC op=stop session=CONSOLE timezone=UTC user=user1 priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=no
hostname=8xxx addr=0.0.0.0 res=success'

---------------------------------------------------------------------------------
Local accounting logs from current boot
```

```
---------------------------------------------------------------------------------
----
type=DAEMON_START msg=audit(Nov 05 2018  23:32:05.642:626) :
auditd start, ver=2.4.3 format=raw kernel=4.9.119-yocto-standard res=success
----
type=USER_START msg=audit(Nov 05 2018  23:35:52.915:11) :
msg='rec=ACCT_EXEC op=start session=CONSOLE timezone=UTC user=admin priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=no
hostname=8xxx addr=0.0.0.0 res=success'
----
type=USYS_CONFIG msg=audit(Nov 05 2018  23:35:52.917:12) :
msg='rec=ACCT_CMD op=stop session=CONSOLE timezone=UTC user=admin priv-lvl=15
auth-method=LOCAL auth-type=LOCAL service=shell isconfig=no data="enable"
hostname=8xxx addr=0.0.0.0 res=success'
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (`#`) or Auditor (`auditor`) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show accounting log port-access

`show accounting log port-access [last <QTY-TO-SHOW> | all]`

### Description

Shows network user accounting log records.

| Parameter | Description |
|---|---|
| `last <QTY-TO-SHOW>` | Specifies how many most-recent accounting log records to show for the current boot. Range: 1 to 1000. |
| `all` | Selects for showing, all accounting records from the current boot and the previous boot. |

### Examples

Showing port access log output. Line breaks have been added for readability.

```
switch# show accounting log port-access all
...
-----
type=USER_ACCT msg=audit(Jan 25 2020  11:03:59.458:70) :
 msg='rec=ACCT_NETWORK session=PORT-ACCESS timezone=Asia/Kolkata user=NETWORK_USER
 auth-method=PORT-ACCESS auth-type=RADIUS service=shell isconfig=no
 "System-accounting-STOP-for-session-port-access User-Name = 0006000000c7,
 Calling-Station-Id = 00:06:00:00:00:c7, NAS-Port-Id = 1/1/2, NAS-Port = 2,
 Acct-Session-Id = 1579930311220, Acct-Session-Time = 128 Acct-Input-Octets =
85607360,
 Acct-Output-Octets = 4305, Acct-Input-Packets = 1337615, Acct-Output-Packets =
32,
 Acct-Input-Gigawords = 0, Acct-Output-Gigawords = 0 Acct-Terminate-Cause = NAS
Request "
 hostname=main1 res=success'
-----
...
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) or Auditor (auditor) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show radius-server

```
show radius-server [detail] [vsx-peer]
```

### Description

Shows configured RADIUS servers information.

| Parameter | Description |
|---|---|
| detail | Selects additional RADIUS server details and global parameters for showing. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

- When the **show radius-server** command shows **None** for the shared-secret, the passkey is missing.
- The **Tracking-Last-Attempted** and **Next-Tracking-Request** fields are applicable only when the RADIUS server tracking method is **access-request**.
- The **TLS Connection Status** section of the output of the **show radius-server detail** command displays the connection status of the TLS connection created for port-access (network client) authentication. If no port-access related configuration is present, the TLS Connection Status field displays a status of **N/A**.

## Examples

Showing a summary of the global RADIUS configuration:

```
switch# show radius-server
******* Global RADIUS Configuration *******

Shared-Secret:<password>
Timeout: 60
Auth-Type: pap
Retries: 5
TLS Timeout: 60
Tracking Time Interval (seconds): 60
Tracking Retries: 5
Tracking User-name: radius-tracking-user
Tracking Password: None
Number of Servers: 1

---------------------------------------------------------------------------
SERVER NAME                                  | TLS  | PORT | VRF
---------------------------------------------------------------------------
20.1.1.129                                   |      | 1812 | default
1.1.1.4                                      |      | 1812 | mgmt
1.1.1.5                                      |      | 12   | mgmt
abc1.com                                     |      | 32   | mgmt
2001:0db8:85a3:0000:0000:8a2e:0371:7334      |      | 1812 | default
1.1.1.6                                      |      | 32   | vrf_red
1.1.1.7                                      |      | 32   | vrf_blue
---------------------------------------------------------------------------
```

Showing a summary of a RADIUS server when the status server time interval is configured:

```
switch# show radius-server
Unreachable servers are preceded by *
******* Global RADIUS Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Retries: 1
TLS Timeout: 5
Tracking Time Interval (seconds): 300
Tracking Retries: 1
Tracking User-name: radius-tracking-user
Tracking Password: None
Status-Server Time Interval (seconds): 400
Number of Servers: 2
--------------------------------------------------------------------------------
SERVER NAME                                  | TLS  | PORT | VRF
--------------------------------------------------------------------------------
1.1.1.1                                      | Yes  | 2083 | default
```

```
2.2.2.2                                      |      | 1812 | default
--------------------------------------------------------------------------------
```

Showing details of a global RADIUS configuration:

```
switch# show radius-server detail
******* Global RADIUS Configuration *******

Shared-Secret: ***
Timeout: 5
Auth-Type: pap
Retries: 5
TLS Timeout: 60
Tracking Time Interval (seconds): 60
Tracking Retries: 5
Tracking User-name: radius-tracking-user
Tracking Password: None
Number of Servers: 1

****** RADIUS Server Information ******
Server-Name               : 20.1.1.129
Auth-Port                 : 1812
Accounting-Port           : 1813
VRF                       : default
TLS Enabled               : No
Shared-Secret             : None
Timeout                   : 60
Retries                   : 5
Auth-Type                 : pap
Server-Group:Priority     : radius:1
Tracking                  : disabled
Tracking-Mode             : any
Reachability-Status       : N/A
ClearPass-Username        :
ClearPass-Password        : None
```

Showing details of a RADIUS server when the per-server shared key and the global RADIUS shared key are not set:

```
switch# show radius-server detail
******* Global RADIUS Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Retries: 1
TLS Timeout : 5
Number of Servers: 1

****** RADIUS Server Information ******
Server-Name               : 1.1.1.1
Auth-Port                 : 2083
VRF                       : default
Shared-Secret (default)   : None
Timeout (default)         : 5
Retries (default)         : 1
Auth-Type (default)       : pap
Server-Group:Priority     : radius:1
Default-Priority          : 1
```

Showing details of a RADIUS server with TLS:

```
switch# show radius-server detail
******* Global RADIUS Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Retries: 1
TLS Timeout: 5
TLS Connection Timeout: 5
TLS Connection Retries: 1
Tracking Time Interval (seconds): 60
Tracking Retries: 1
Tracking User-name: jim
Tracking Password: ***
Number of Servers: 1

****** RADIUS Server Information ******
Server-Name              : 172.20.30.30
Auth-Port                : 2083
Accounting-Port          : 2083
VRF                      : default
TLS Enabled              : Yes
TLS Connection Timeout (default): 5
TLS Connection Retries (default): 1
TLS Connection Status    : tls_connection_established
Timeout (default)        : 5
Auth-Type (default)      : pap
Server-Group:Priority    : radius:1
Tracking                 : enabled
Tracking-Mode            : any
Reachability-Status      : reachable
ClearPass-Username       : admin
ClearPass-Password       : ***
```

Showing details of a RADIUS server when the **status-server** tracking method is configured:

```
switch# show radius-server detail
******* Global RADIUS Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Retries: 1
TLS Timeout: 5
Tracking Time Interval (seconds): 300
Tracking Retries: 1
Tracking User-name: radius-tracking-user
Tracking Password: None
Status-Server Time Interval (seconds)       : 600
Number of Servers: 1

****** RADIUS Server Information ******
Server-Name                                 : 2.2.2.2
Auth-Port                                   : 2083
Accounting-Port                             : 2083
VRF                                         : default
TLS Enabled                                 : Yes
TLS Connection Status                       : tls_connection_established
Timeout                                     : 5
```

```
Auth-Type                                    : pap
Server-Group:Priority                        : radius:1
Default-Priority                             : 1
ClearPass-Username                           :
ClearPass-Password                           : None
Tracking                                     : disabled
Tracking-Mode                                : any
Tracking-Method                              : status-server
Reachability-Status                          : unknown
Tracking-Last-Attempted                      : N/A
Next-Tracking-Request                        : N/A
Port-Access session                          : status-server
```

Showing details of a RADIUS server when the **keep-alive** tracking method is configured:

```
switch# show radius-server detail
******* Global RADIUS Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Retries: 1
TLS Timeout: 5
Tracking Time Interval (seconds): 300
Tracking Retries: 1
Tracking User-name: radius-tracking-user
Tracking Password: None
Status-Server Time Interval (seconds)        : 400
Number of Servers: 1

****** RADIUS Server Information ******
Server-Name                                  : 1.1.1.1
Auth-Port                                    : 2083
Accounting-Port                              : 2083
VRF                                          : default
TLS Enabled                                  : Yes
TLS Connection Status                        : tcp_connection_failed
Timeout                                      : 5
Auth-Type                                    : pap
Server-Group:Priority                        : radius:1
ClearPass-Username                           :
ClearPass-Password                           : None
Tracking                                     : disabled
Tracking-Mode                                : any
Tracking-Method                              : keep-alive
Reachability-Status                          : unknown
Tracking-Last-Attempted                      : N/A
Next-Tracking-Request                        : N/A
Port-Access session                          : status-server
```

Showing details of a RADIUS server when the **access-request** tracking method is configured:

```
switch# show radius-server detail
******* Global RADIUS Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Retries: 1
```

```
TLS Timeout: 5
Tracking Time Interval (seconds): 300
Tracking Retries: 1
Tracking User-name: radius-tracking-user
Tracking Password: None
Status-Server Time Interval (seconds)       : 500
Number of Servers: 1

****** RADIUS Server Information ******
Server-Name                                 : 4.4.4.4
Auth-Port                                   : 2083
Accounting-Port                             : 2083
VRF                                         : default
TLS Enabled                                 : Yes
TLS Connection Status                       : tcp_connection_failed
Timeout                                     : 5
Auth-Type                                   : pap
Server-Group:Priority                       : radius:1
ClearPass-Username                          :
ClearPass-Password                          : None
Tracking                                    : disabled
Tracking-Mode                               : any
Tracking-Method                             : access-request
Reachability-Status                         : unknown
Tracking-Last-Attempted                     : N/A
Next-Tracking-Request                       : N/A
Port-Access session                         : keep-alive
```

Showing details of a RADIUS server when the server group is configured:

```
switch# show radius-server detail
******* Global RADIUS Configuration *******

Shared-Secret: None
Timeout: 10
Auth-Type: pap
Retries: 5
TLS Timeout: 5
Tracking Time Interval (seconds): 60
Tracking Retries: 5
Tracking User-name: radius
Tracking Password: None
Status-Server Time Interval (seconds): 300
Number of Servers: 12
AAA Server Status Trap: Enabled

****** RADIUS Server Information ******
Server-Name              : cppm2.cxsecurity.com
Auth-Port                : 1812
Accounting-Port          : 1813
VRF                      : sss
TLS Enabled              : No
Shared-Secret            : ***
Timeout                  : 10
Retries                  : 5
Auth-Type                : pap
Server-Group:Priority    : RG1:1, RG2:1, RG3:1, RG4:1
ClearPass-Username       :
ClearPass-Password       : None
Tracking                 : enabled
Tracking-Mode            : any
```

```
Reachability-Status       : reachable, Since Tue Mar 14 19:58:45 UTC 2023
Tracking-Last-Attempted   : Thu Mar 16 10:23:46 UTC 2023
Next-Tracking-Request     : 36 seconds
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show radius-server secure ipsec

```
show radius-server secure ipsec { server-list | host {<FQDN> | <IPV4> |  <IPv6>}
     [port <PORT-NUMBER>] [vrf <VRF-NAME>] [vsx-peer] }
```

### Description

Shows information for one or all RADIUS servers configured with IPsec.

| Parameter | Description |
|---|---|
| `server-list` | Selects all servers for showing. |
| `{<FQDN> \| <IPV4> \| <IPv6>}` | Specifies the RADIUS server as:<br>▪ *<FQDN>*: a fully qualified domain name.<br>▪ *<IPV4>*: an IPv4 address.<br>▪ *<IPV6>*: an IPv6 address. |
| `port <PORT-NUMBER>` | Specifies the authentication port number. Range: 1 to 65535. Default: 1812. |
| `vrf <VRF-NAME>` | Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named **default** is used. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

The IPsec key is shown in an exportable ciphertext format.

### Examples

Showing information for RADIUS server 1.1.1.1 secured with IPsec:

```
switch# show radius-server secure ipsec host 1.1.1.1
IPsec                         : enabled
Protocol                      : ESP
Authentication                : MD5
Encryption                    : AES
SPI                           : 1234
```

Showing information for all RADIUS servers secured with IPsec:

```
switch# show radius-server secure ipsec server-list
Server                        : 1.1.1.1
IPsec                         : enabled
Protocol                      : ESP
Authentication                : MD5
Encryption                    : AES
SPI                           : 1234

Server                        : 1.1.1.2
IPsec                         : enabled
Protocol                      : ESP
Authentication                : MD5
Encryption                    : AES
SPI                           : 12341
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platorms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show radius-server statistics

```
show radius-server statistics {authentication | accounting} [vsx-peer]
```

### Description

Shows authentication or accounting statistics for all configured RADIUS servers.

The accounting statistics are only for port access.

| Parameter | Description |
|---|---|
| `{authentication \| accounting}` | Selects the type of statistics to show. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Showing RADIUS server authentication statistics:

```
switch# show radius-server statistics authentication
 Server Name     : rad1
 Auth-Port       : 1812
 Accounting-Port : 1813
 VRF             : mgmt
 TLS Enabled     : Yes

  Authentication Statistics
  -------------------------
    Round Trip Time            : 100
    Pending Requests           : 0
    Timeouts                   : 6
    Bad Authenticators         : 2
    Packets Dropped            : 0
    Access Requests            : 20
    Access Challenge           : 8
    Access Accepts             : 14
    Access Rejects             : 0
    Access Response Malformed  : 0
    Access Retransmits         : 0
    Tracking Requests          : 5
    Tracking Responses         : 5
    Unknown Response Code      : 0
```

Showing RADIUS server accounting statistics:

```
switch# show radius-server statistics accounting
 Server Name     : rad1
 Auth-Port       : 1812
 Accounting-Port : 1813
 VRF             : mgmt
 TLS Enabled     : No

  Accounting Statistics
  -------------------------
    Round Trip Time                : 100
    Pending Requests               : 0
    Timeouts                       : 5
    Bad Authenticators             : 1
    Packets Dropped                : 0
    Accounting Requests            : 15
    Accounting Responses           : 10
    Accounting Response Malformed  : 0
    Accounting Retransmits         : 0
    Unknown Response Code          : 0
```

Showing RADIUS server authentication statistics when RADIUS server tracking method is configured:

```
switch# show radius-server statistics authentication
 Server Name      : 10.93.48.200
 Auth-Port        : 2083
 Accounting-Port  : 2083
 VRF              : mgmt
 TLS Enabled      : yes

  Authentication Statistics
  -------------------------
    Round Trip Time                                        : 101
    Pending Requests                                       : 0
    Timeouts                                               : 342
    Bad Authenticators                                     : 0
    Packets Dropped                                        : 0
    Access Requests                                        : 779
    Access challenge                                       : 182
    Access Accepts                                         : 4
    Access Rejects                                         : 251
    Access Response Malformed                              : 0
    Access Retransmits                                     : 200
    Tracking Requests                                      : 280
    Tracking Responses                                     : 142
    Status-Server Requests   (Tracking session)            : 280
    Status-Server Responses  (Tracking session)            : 280
    Status-Server Requests   (port-access session)         : 280
    Status-Server Responses  (port-access session)         : 280
    Unknown Response Code                                  : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show radius-server statistics host

```
show radius-server statistics {authentication | accounting}
     host {<FQDN> | <IPV4> |  <IPv6>}
     [tls] [port <PORT-NUMBER>] [vrf <VRF-NAME>] [vsx-peer]
```

### Description

Shows authentication or accounting statistics for the specified RADIUS server.

The accounting statistics are only for port access.

| Parameter | Description |
|---|---|
| `{authentication \| accounting}` | Selects the type of statistics to show. |
| `{`*`<FQDN>`*` \| `*`<IPV4>`*` \| `*`<IPv6>`*`}` | Specifies the RADIUS server as:<br>■ *<FQDN>*: a fully qualified domain name.<br>■ *<IPV4>*: an IPv4 address.<br>■ *<IPV6>*: an IPv6 address. |
| `tls` | Selects TLS. |
| `port `*`<PORT-NUMBER>`* | Specifies the authentication port number. Range: 1 to 65535. Default: 1812. |
| `vrf `*`<VRF-NAME>`* | Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named **default** is used. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Showing RADIUS server authentication statistics with TLS enabled:

```
switch# show radius-server statistics authentication host 20.1.1.49 tls
 Server Name     : 20.1.1.49
 Auth-Port       : 2083
 Accounting-Port : 2083
 VRF             : default
 TLS Enabled     : Yes

  Authentication Statistics
  -------------------------
    Round Trip Time           : 3
    Pending Requests          : 0
    Timeouts                  : 0
    Bad Authenticators        : 0
    Packets Dropped           : 0
    Access Requests           : 13
    Access challenge          : 6
    Access Accepts            : 3
    Access Rejects            : 4
    Access Response Malformed : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show tacacs-server

`show tacacs-server [detail] [vsx-peer]`

## Description

Shows the configured TACACS+ servers.

| Parameter | Description |
|---|---|
| `detail` | Selects additional TACACS+ server details and global parameters for showing. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Showing a summary of a global TACACS+ configuration with a shared-secret:

```
switch# show tacacs-server
******* Global TACACS+ Configuration *******

Shared-Secret: AQBapb+HsdpqV1Q3CPCBMQTG8e1cA+CyD0RvfbeA8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout: 5
Auth-Type: pap
Number of Servers: 5

--------------------------------------------------------------------------------
SERVER NAME                                    | PORT | VRF
--------------------------------------------------------------------------------
1.1.1.1                                        | 49   | mgmt
1.1.1.2                                        | 12   | mgmt
abc.com                                        | 32   | vrf_blue
2001:0db8:85a3:0000:0000:8a2e:0370:7334        | 49   | default
1.1.1.3                                        | 32   | vrf_red
--------------------------------------------------------------------------------
```

Showing details of a global TACACS+ configuration:

```
switch# show tacacs-server detail
******* Global TACACS+ Configuration *******

Shared-Secret: AQBapb+HsdpqV1Q3CPCBMQTG8e1cA+CyD0RvfbeA8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout: 5
Auth-Type: pap
Number of Servers: 5
```

```
****** TACACS+ Server Information ******
Server-Name              : 1.1.1.2
Auth-Port                : 12
VRF                      : mgmt
Shared-Secret (default)  : AQBapb+HsdpqV1Q3CPCBMQTG8eeA8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout (default)        : 5
Auth-Type (default)      : pap
Server-Group             : sg1
Group-Priority           : 1

Server-Name              : 2001:0db8:85a3:0000:0000:8a2e:0370:7334
Auth-Port                : 49
VRF                      : default
Shared-Secret (default)  : AQBapb+HsdpqV1Q3CPCBMQTG8eeA8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout (default)        : 5
Auth-Type (default)      : pap
Server-Group             : sg2
Group-Priority           : 1

Server-Name              : 1.1.1.1
Auth-Port                : 49
VRF                      : mgmt
Shared-Secret (default)  : AQBapb+HsdpqV1Q3CPCBMQTG8eeA8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout (default)        : 5
Auth-Type (default)      : pap
Server-Group (default)   : tacacs
Default-Priority         : 1

Server-Name              : abc.com
Auth-Port                : 32
VRF                      : vrf_red
Shared-Secret (default)  : AQBapb+HsdpqV1Q3CPCBMQTG8eeA8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout                  : 15
Auth-Type (default)      : pap
Server-Group (default)   : tacacs
Default-Priority         : 3

Server-Name              : 1.1.1.3
Auth-Port                : 32
VRF                      : vrf_blue
Shared-Secret            : AQBapfnqbSswqKC476tdUFZ+AncIRY92hDTYkQCAAAAFEAaHn43vNC
Timeout                  : 15
Auth-Type                : chap
Server-Group (default)   : tacacs
Default-Priority         : 5
```

Showing TACACS+ server when per-server shared key and global TACACS+ shared key is not set:

```
switch# show tacacs-server
******* Global TACACS+ Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Number of Servers: 1

--------------------------------------------------------------------------------
SERVER NAME                                   | PORT | VRF
--------------------------------------------------------------------------------
1.1.1.1                                       | 49   | default
--------------------------------------------------------------------------------
```

Showing TACACS+ server details when per-server shared key and global TACACS+ shared key is not set:

```
switch# show tacacs-server detail
******* Global TACACS+ Configuration *******

Shared-Secret: None
Timeout: 5
Auth-Type: pap
Number of Servers: 1

****** TACACS+ Server Information ******
Server-Name                 : 1.1.1.1
Auth-Port                   : 49
VRF                         : default
Shared-Secret (default)     : None
Timeout (default)           : 5
Auth-Type (default)         : pap
Server-Group (default)      : tacacs
Default-Priority            : 1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show tacacs-server statistics

`show tacacs-server statistics [vsx-peer]`

### Description

Shows authentication statistics for all configured TACACS+ servers.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing TACACS+ server authentication statistics:

```
switch# show tacacs-server statistics
Server Name      : tac1
Auth-Port        : 49
VRF              : mgmt
Authentication Statistics
----------------------------------------------
Round Trip Time            : 1
Pending Requests           : 0
Timeout                    : 0
Unknown Types              : 0
Packet Dropped             : 0
Auth Start                 : 8
Auth challenge             : 0
Auth Accepts               : 4
Auth Rejects               : 4
Auth reply malformed       : 0
Tracking Requests          : 0
Tracking Responses         : 0
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show tech aaa

`show tech aaa`

## Description

Shows the AAA configuration settings.

## Example

Showing the AAA configuration settings:

```
switch# show tech aaa

====================================================
Show Tech executed on Tue Feb 14 02:19:11 2017
====================================================
====================================================
[Begin] Feature aaa
```

```
====================================================

*********************************
Command : show aaa authentication
*********************************
AAA Authentication:
  Fail-through              : Enabled
  Limit Login Attempts      : Not set
  Lockout Time              : 300
  Minimum Password Length   : Not set

Authentication for ssh channel:

---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------

Authentication for https-server channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------

Authentication for console channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------

Authentication for default channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
tacacs                           | 0
local                            | 1
---------------------------------------------------------------------------------

Authentication for telnet channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------

*********************************
Command : show aaa accounting
*********************************
AAA Accounting:

Accounting for default channel:
  Accounting Type                               : all
  Accounting Mode                               : start-stop
Default Accounting for login Channels:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------
```

~~~
Accounting for ssh channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
tacacs                           | 0
local                            | 1
---------------------------------------------------------------------------------

Accounting for https-server channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
tacacs                           | 0
---------------------------------------------------------------------------------

Accounting for telnet channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
tacacs                           | 0
local                            | 1
---------------------------------------------------------------------------------


**********************************************
Command : show aaa accounting port-access
**********************************************
```
AAA Accounting Port Access
===========================
  Radius Accounting Enabled        : yes
  Radius Server Group              : acct_group
  Local Accounting Enabled         : no
  Accounting Mode                  : start-stop
  Interim Update Enabled           : true
  Interim Interval                 : 12 minutes
  Interim Update on-reauth Enabled : true
```

****************************************
Syntax  : show aaa accounting port-access interface <IFNAME | all> client-status
[mac <MAC-ADDRESS>]
Command : show aaa accounting port-access interface 1/1/1 client-status
****************************************
```
Port Access Client Status Details

Client 00:50:56:96:5b:9f, steve
============================
  Session Details
  ---------------
    Port                : 1/1/22
    Session Time        : 141s
    IPv4 Address        : 10.0.0.3
    IPv6 Address        : 2001::1
                          2001::3


  Accounting Details
  ----------------------
    Accounting Session ID  : 1584556574841
~~~

~~~
    Input Packets          : 265
    Input Octets           : 28348
    Output Packets         : 341
    Output Octets          : 37761
    Input Gigaword         : 0
    Output Gigaword        : 0
```

```

##### No aaa clients

When there are no port-access accounting sessions:

```
switch# show aaa accounting port-access interface all client-status
Port-access accounting sessions not found.

switch# show aaa accounting port-access interface 1/1/2 client-status
Port-access accounting sessions not found.

switch# show aaa accounting port-access interface 1/1/2 client-status mac
6e:93:79:d9:cb:ee
Port-access accounting sessions not found.
```

*******************************************
Syntax  : show accounting log {all | port-access}
Command : show accounting log port-access
*******************************************
Command to display the Local accouting logs for the network user.
```
-----
May 29 2018 20:29:03.714:53 'acct-id=56789453 type=network user=NWUSER auth-
method=dot1x auth-type=radius rec=ACCT_START mac=00:0d:6a:4f:2a:44 input-pkt=0
ouput-pkt=0 input-octet=0 output-octets=0'
-----
May 29 2018 20:30:03.714:53 'acct-id=56789453 type=network user=NWUSER auth-
method=dot1x auth-type=radius rec=ACCT_INTRM mac=00:0d:6a:4f:2a:44 input-pkt=2
ouput-pkt=30 input-octet=20 output-octets=50'
-----
May 29 2018 24:29:03.714:53 'acct-id=56789453 type=network user=NWUSER auth-
method=dot1x auth-type=radius rec=ACCT_STOP mac=00:0d:6a:4f:2a:44 input-pkt=20
ouput-pkt=300 input-octet=200 output-octets=500'
-----
May 29 2018 20:29:03.714:53 'acct-id=56789453 type=network user=NWUSER aauth-
method=macauth auth-type=local rec=ACCT_START mac=00:0d:6a:4f:2a:44 input-pkt=0
ouput-pkt=0 input-octet=0 output-octets=0'
------
```

*******************************************************************************
Syntax  : show radius-server statistics {authentication | accounting}
*******************************************************************************
****************************************************************
Command : show radius-server statistics authentication
****************************************************************
```
 Server Name     : 2.2.2.2
 Auth-Port       : 1812
 Accounting-Port : 1813
 VRF             : mgmt
~~~

~~~~

  Authentication Statistics
  -------------------------
    Round Trip Time           : 100
    Pending Requests          : 0
    Timeouts                  : 6
    Bad Authenticators        : 2
    Packets Dropped           : 0
    Access Requests           : 20
    Access Challenge          : 8
    Access Accepts            : 14
    Access Rejects            : 0
    Access Response Malformed : 0
    Access Retransmits        : 0
    Tracking Requests         : 5
    Tracking Responses        : 5
    Unknown Response Code     : 0
```
****************************************************************
Command : show radius-server statistics accounting
****************************************************************
```
 Server Name     : 2.2.2.2
 Auth-Port       : 1812
 Accounting-Port : 1813
 VRF             : mgmt

  Accounting Statistics
  -------------------------
    Round Trip Time               : 100
    Pending Requests              : 0
    Timeouts                      : 5
    Bad Authenticators            : 1
    Packets Dropped               : 0
    Accounting Requests           : 15
    Accounting Responses          : 10
    Accounting Response Malformed : 0
    Accounting Retransmits        : 0
    Unknown Response Code         : 0
```

*********************************
Command : show aaa authorization
*********************************

Authorization for default channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------

Authorization for console channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
local                            | 0
---------------------------------------------------------------------------------

Authorization for ssh channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
~~~~

```
---------------------------------------------------------------------------------
tacacs                           | 0
local                            | 1
---------------------------------------------------------------------------------

Authorization for telnet channel:
---------------------------------------------------------------------------------
GROUP NAME                       | GROUP PRIORITY
---------------------------------------------------------------------------------
tacacs                           | 0
local                            | 1
---------------------------------------------------------------------------------

*********************************
Command : show aaa server-groups
*********************************

******* AAA Mechanism TACACS+ *******
----------------------------------------------------------------------------------
-----
GROUP NAME                      | SERVER NAME              | PORT | PRIORITY | VRF
----------------------------------------------------------------------------------
-----
tacacs                          | 1.1.1.1                  | 49   | 1        |
mgmt
----------------------------------------------------------------------------------
-----

******* AAA Mechanism RADIUS *******
----------------------------------------------------------------------------------
-----
GROUP NAME                      | SERVER NAME              | PORT | PRIORITY | VRF
----------------------------------------------------------------------------------
-----

***********************************
Command : show tacacs-server detail
***********************************
******* Global TACACS+ Configuration *******

Shared-Secret: AQBapb+HsdpqV1Q3CPCBMQTG8ekK1c...fbeA8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout: 5
Auth-Type: pap
Tracking Time Interval (seconds): 300
Tracking User-name: tacacs-tracking-user
Tracking Password: None
Number of Servers: 1

****** TACACS+ Server Information ******
Server-Name              : 1.1.1.1
Auth-Port                : 49
VRF                      : mgmt
Shared-Secret            : AQBapfiTREwB7yUKCdmOMT0f...9j2AUxlGAAAAF2MkfMTojqX

Timeout                  : 5
Auth-Type                : pap
Server-Group             : tacacs
Default-Priority         : 1
Tracking                 : disabled
Reachability-Status      : N/A

***********************************
```

```
Command : show radius-server detail
***********************************
******* Global RADIUS Configuration *******

Shared-Secret: AQBapb+HsdpqV1Q3CPCBMQTG8ekK1cA+Cy...8BEgikCgAAAJOwZSNzA2SWrLA=
Timeout: 5
Auth-Type: pap
Retries: 1
Number of Servers: 0

====================================================
[End] Feature aaa
====================================================


====================================================
Show Tech commands executed successfully
====================================================
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## tacacs-server auth-type

```
tacacs-server auth-type {pap | chap}
no tacacs-server auth-type [pap | chap]
```

### Description

Enables the CHAP or PAP authentication protocol, which is used for communication with the TACACS+ servers, at the global level. You can override this command with a fine-grained per server **auth-type** configuration.

The **no** form of this command resets the global authentication mechanism for TACACS+ to PAP, which is the default authentication mechanism for TACACS+.

| Parameter | Description |
|---|---|
| `auth-type {pap \| chap}` | Selects either the PAP or CHAP authentication protocol. |

### Examples

Enabling command for CHAP authentication:

```
switch(config)# tacacs-server auth-type chap
```

Enabling command for PAP authentication:

```
switch(config)# tacacs-server auth-type pap
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |

## tacacs-server host

```
tacacs-server host {<FQDN> | <IPV4> | <IPV6>}
    [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
    [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
    [auth-type {pap | chap}] [tracking {enable | disable}] [vrf <VRF-NAME>]

no tacacs-server host {<FQDN> | <IPV4> | <IPV6>}
    [key [plaintext <PASSKEY> | ciphertext <PASSKEY>]]
    [timeout <TIMEOUT-SECONDS>] [port <PORT-NUMBER>]
    [auth-type {pap | chap}] [tracking {enable | disable}] [vrf <VRF-NAME>]
```

### Description

Adds a TACACS+ server. By default, the TACACS+ server is associated with the server group named **tacacs**.

The **no** form of this command removes a previously added TACACS+ server.

| Parameter | Description |
|---|---|
| `{<FQDN> \| <IPV4> \| <IPv6>}` | Specifies the TACACS+ server as:<br>■ *<FQDN>*: a fully qualified domain name.<br>■ *<IPV4>*: an IPv4 address.<br>■ *<IPV6>*: an IPv6 address. |
| `key [plaintext <PASSKEY> \|` | Selects either a plaintext or an encrypted local shared-secret |

| Parameter | Description |
|---|---|
| `ciphertext <PASSKEY>]` | passkey for the server. As per RFC 2865, shared-secret can be a mix of alphanumeric and special characters. Plaintext passkeys are between 1 and 32 alphanumeric and special characters.<br>**NOTE:** When **key** is entered without either sub-parameter, plaintext passkey prompting occurs upon pressing Enter. Enter must be pressed immediately after the **key** parameter without entering other parameters. The entered passkey characters are masked with asterisks. When **key** is omitted, the server uses the global passkey. This command requires either the global or local passkey to be set; otherwise the server will not be contacted. Command **tacacs-server key** is available for setting the global passkey. |
| `timeout <TIMEOUT-SECONDS>` | Specifies the timeout. Range: 1 to 60 seconds. Default : 5 seconds. |
| `port <PORT-NUMBER>` | Specifies the TCP authentication port number. Range: 1 to 65535. Default: 49. |
| `auth-type {pap \| chap}` | Selects either the PAP (the default) or CHAP authentication types. If this parameter is not specified, the TACACS+ global default is used. |
| `tracking {enable \| disable}` | Enables or disables server tracking for the RADIUS server. Tracked servers are probed at the start of each server tracking interval to check if they are reachable.<br>Use command **tacacs-server tracking** to configure TACACS+ server tracking globally. |
| `vrf <VRF-NAME>` | Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named **default** is used. |

## Usage

If the fully qualified domain name is provided for the TACACS+ server, a DNS server must be configured and accessible through the same VRF which is configured for the TACACS+ server. This configuration is required for the resolution of the TACACS+ server hostname to its IP address. If a DNS server is not available for this VRF, the TACACS+ servers reachable through this VRF must be configured by means of their IP addresses only.

## Examples

Adding a TACACS+ server with an IPv4 address, plaintext passkey, timeout, port, authentication type, and VRF name:

```
switch(config)# tacacs-server host 1.1.1.3 key plaintext test-123 timeout 15 port
32 auth-type chap vrf vrf_red
```

Adding a TACACS+ server with an IPv4 address and prompted plaintext passkey:

```
switch(config)# tacacs-server host 1.1.1.5 key
Enter the TACACS server key: *********
Re-Enter the TACACS server key: *********
```

Adding a TACACS+ server with an IPv4 address and a named VRF:

```
switch(config)# tacacs-server host 1.1.1.1 vrf mgmt
```

Adding a TACACS+ server with an IPv4 address, a port, and a named VRF:

```
switch(config)# tacacs-server host 1.1.1.2 port 32 vrf mgmt
```

Adding a TACACS+ server with an FQDN, a timeout, port number, and a named VRF:

```
switch(config)# tacacs-server host abc.com timeout 15 port 32 vrf vrf_blue
```

Adding a TACACS+ server with an IPv6 address:

```
switch(config)# tacacs-server host 2001:0db8:85a3:0000:0000:8a2e:0370:7334
```

Deleting a TACACS+ server with an IPv4 address and specified VRF:

```
switch(config)# no tacacs-server host 1.1.1.1 vrf mgmt
```

Deleting a TACACS+ server with an FQDN, port, and specified VRF:

```
switch(config)# no tacacs-server host abc.com port 32 vrf vrf_blue
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |

## tacacs-server key

```
tacacs-server key [plaintext <GLOBAL-PASSKEY> | ciphertext <GLOBAL-PASSKEY>]
no tacacs-server key [plaintext <GLOBAL-PASSKEY> | ciphertext <GLOBAL-PASSKEY>]
```

### Description

Creates or modifies a TACACS+ global passkey. The TACACS+ global passkey is used as a shared-secret for encrypting the communication between all TACACS+ servers and the switch. The TACACS+ global passkey is required for authentication unless local passkeys have been set. By default, the TACACS+ global passkey is empty. If the administrator has not set this key, the switch will not be able to perform TACACS+ authentication. The switch will instead rely on the authentication mechanism configured with **aaa authentication login**.

When this command is entered without parameters, plaintext passkey prompting occurs upon pressing Enter. The entered passkey characters are masked with asterisks.

The **no** form of the command removes the global passkey.

| Parameter | Description |
|---|---|
| `plaintext` *<GLOBAL-PASSKEY>* | Specifies the TACACS+ global passkey in plaintext format with a length of 1 to 31 characters. As per RFC 2865, a shared-secret can be a mix of alphanumeric and special characters. |
| `ciphertext` *<GLOBAL-PASSKEY>* | Specifies the TACACS+ global passkey in encrypted format. |

### Examples

Adding the global passkey:

```
switch(config)# tacacs-server key plaintext mypasskey123
```

Adding the global passkey with prompting:

```
switch(config)# tacacs-server key
Enter the TACACS server key: *********
Re-Enter the TACACS server key: *********
```

Removing the global passkey:

```
switch(config)# no tacacs-server key
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## tacacs-server timeout

```
tacacs-server timeout [<1-60>]
no tacacs-server timeout [<1-60>]
```

### Description

Specifies the number of seconds to wait for a response from the TACACS+ server before trying the next TACACS+ server. If a value is not specified, a default value of 5 seconds is used. You can override this value with a fine-grained per server timeout configured for individual servers.

The **no** form of this command resets the TACACS+ global authentication timeout to the default of 5 seconds.

| Parameter | Description |
|---|---|
| `timeout <1-60>` | Specifies the timeout interval of 1 to 60 seconds. Default: 5 seconds. |

### Examples

Specifying the TACACS+ server timeout:

```
switch(config)# tacacs-server timeout 10
```

Resetting the timeout for the TACACS+ server to the default:

```
switch(config)# no tacacs-server timeout
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# tacacs-server tracking

```
tacacs-server tracking interval <INTERVAL>
no tacacs-server tracking interval [<INTERVAL>]

tacacs-server tracking user-name <NAME>
   [password [plaintext <PASSWORD> | ciphertext <PASSWORD>]]
no tacacs-server tracking [user-name [<NAME>] [ciphertext <PASSWORD>]]
```

## Description

Configures TACACS+ server tracking settings globally for all configured TACACS+ servers that have tracking enabled with the **tacacs-server host** command on individual servers.

The **no** form of the command removes the specified configuration, reverting it to its default. The no form with **user-name** also clears the password (resets it to empty).

| Parameter | Description |
|---|---|
| `interval <INTERVAL>` | Specifies the time interval, in seconds, to wait before checking the server reachability status. Default: 300. Range 60 to 84600. |
| `user-name <NAME> [password [plaintext <PASSWORD> \| ciphertext <PASSWORD>]]` | Specifies the user name (and optionally a password) to be used for server checking. The default user name is **tacacs-tracking-user** with an empty password.<br>The password is optional and may be entered as **plaintext** or pasted in as **ciphertext**. The plaintext password is visible as cleartext when entered but is encrypted thereafter. Command history does show the password as cleartext.<br>**NOTE:** When **password** is entered without a following sub-parameter, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.<br>**NOTE:** The user does not have to be configured on the server. Server tracking can still be performed with a user which is not configured on the server because authentication failure on the server achieves confirmation that the server is reachable.<br>**NOTE:** Server tracking uses authentication request and response packets to determine server reachability status. The server tracking user name and password are used to form the request packet which is sent to the server with tracking enabled. Upon receiving a response to the request packet, the server is considered to be reachable. |

## Examples

Configuring a tracking interval of 120 seconds:

```
switch(config)# tacacs-server tracking interval 120
```

Reverting the tracking interval to its default of 300 seconds:

```
switch(config)# no tacacs-server tracking interval
```

Configuring user **tacacs-tracker** with a plaintext password.

```
switch(config)# tacacs-server tracking user-name tacacs-tracker password plaintext
track$1
```

Configuring user **tacacs-tracker** with a prompted plaintext password.

```
switch(config)# tacacs-server tracking user-name tacacs-tracker password
Enter the TACACS server tracking password: *******
Re-Enter the TACACS server tracking password: *******
```

Reverting the tracking user name to its default of **tacacs-tracking-user**:

```
switch(config)# no tacacs-server tracking user-name
```

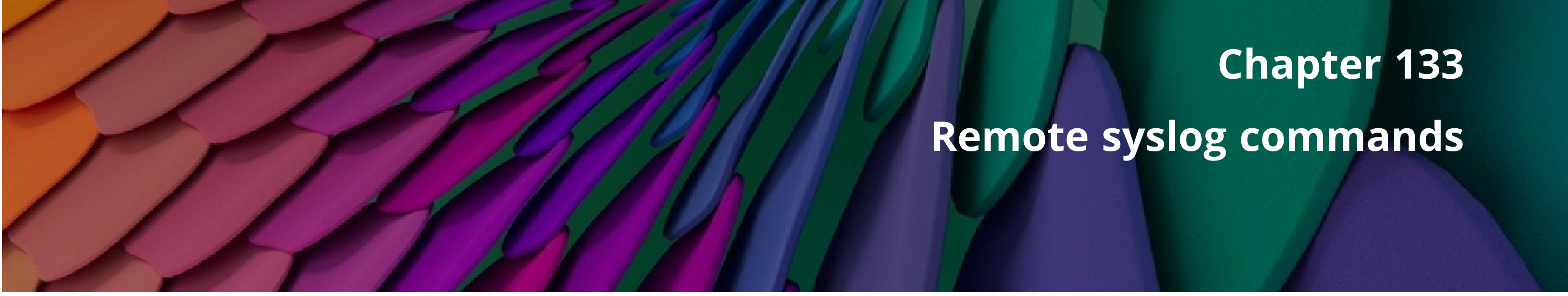
For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |



# Chapter 133

# Remote syslog commands

## clear accounting-logs

```
clear accounting-logs
```

### Description

Use this command to clear accounting logs. Once issued, only logs generated after this command is run will be displayed in the output of the **show accounting log** commands.

This command will not clear logs when the logging accounting-format-native feature is configured. To clear accounting logs on switches with this feature enabled, users should first revert the native accounting format back to the default AOS-CX format by executing the **no logging accounting-format-native** command.

### Example

```
switch(config)# clear accounting-logs
```

The following example shows that accounting logs cannot be cleared using the clear accounting-logs command if the **logging accounting-native-format** command has been enabled, and that disabling this option with the **no logging accounting-format-native** command again allows the accounting logs to be cleared.

```
switch# logging audit-format-native
switch# clear accounting-logs
Warning: Clear accounting-logs is not supported for 'audit-format-native'.
switch# no logging audit-format-native
switch# clear accounting-logs
switch# show accounting log last 5
---------------------------------------------------
Command logs from current boot
---------------------------------------------------
No command logs has been logged in the system
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

## logging

```
logging {<IPV4-ADDR> | <IPV6-ADDR> | <FQDN | HOSTNAME>} {udp [<PORT-NUM>]}|{tcp [<PORT-
NUM>]}|{|tls [<PORT-NUM>]}
   auth-mode {certificate|subject-name}
   disable
   filter <FILTER-NAME>
   include-auditable-events
   legacy-tls-renegotiation]
   rate-limit-burst <BURST>
   rate-limit-interval <INTERVAL>] ]
   severity <LEVEL>]
   vrf <VRF-NAME>]

no logging {<IPV4-ADDR> | <IPV6-ADDR> | <FQDN | HOSTNAME> }
```

### Description

Enables syslog forwarding to a remote syslog server.

The **no** form of this command disables syslog forwarding to a remote syslog server.

Starting with AOS-CX 10.11, payload information is present in accounting logs.

The maximum REST payload that can be sent to RADIUS/TACACS server is 1024 characters, and the maximum of REST payload that can be sent to syslog server is 3500 characters. If this limit is is reached, the log will display three dots (...) to indicate that the log an exceeded the character limit and is incomplete.

| Parameter | Description |
|---|---|
| `{<IPV4-ADDR> \| <IPV6-ADDR> \| <HOSTNAME>}` | Selects the IPv4 address, IPv6 address, or host name of the remote syslog server. Required. |
| `[udp [<PORT-NUM>] \| tcp [<PORT-NUM> \| tls [<PORT-NUM>]]` | Specifies the UDP port, TCP port, or TLS port of the remote syslog server to receive the forwarded syslog messages. |
| `udp [<PORT-NUM>]` | Range: 1 to 65535. Default: 514 |
| `tcp [<PORT-NUM>]` | Range: 1 to 65535. Default: 1470 |
| `tls [<PORT-NUM>]` | Range: 1 to 65535. Default: 6514 |
| `auth-mode` | Specifies the TLS authentication mode used to validate the certificate.<br>■ **certificate**: Validates the peer using trust anchor certificate based authentication. Default.<br>■ **subject-name**: Validates the peer using trust anchor certificates as well as subject-name based authentication. |

| Parameter | Description |
|---|---|
| `disable` | Disable remote syslog confguration. This does not delete the configuration, just disables/pauses the forwarding of syslog messagesto the remote server. The config/forwarding can be reenabled (un-paused) again using the **no logging <hostname> disable** command. |
| `filter <FILTER-NAME>` | Specifies the name of the filter to be applied on the syslog messages. |
| `include-auditable-events` | Specifies that auditable messages are also logged to the remote syslog server. |
| `legacy-tls-renegotiation` | Enables the TLS connection with a remote syslog server supporting legacy renegotiation. |
| `rate-limit-burst <BURST>` | Specifies the rate limit for the messages sent to the remote syslog server. |
| `rate-limit-interval <INTERVAL>` | Specifies the rate limit interval in seconds. Default: 30 Seconds |
| `severity <LEVEL>` | Specifies the severity of the syslog messages:<br>■ **alert**: Forwards syslog messages with the severity of **alert (6)** and **emergency (7)**.<br>■ **crit**: Forwards syslog messages with the severity of **critical (5)** and above.<br>■ **debug**: Forwards syslog messages with the severity of **debug (0)** and above.<br>■ **emerg**: Forwards syslog messages with the severity of **emergency (7)** only.<br>■ **err**: Forwards syslog messages with the severity of **err (4)** and above<br>■ **info**: Forwards syslog messages with the severity of **info (1)** and above. Default.<br>■ **notice**: Forwards syslog messages with the severity of **notice (2)** and above.<br>■ **warning**: Forwards syslog messages with the severity of **warning (3)** and above. |
| `vrf <VRF-NAME>` | Specifies the VRF used to connect to the syslog server. Optional. Default: `default` |

## Examples

Enabling the syslog forwarding to remote syslog server 10.0.10.2:

```
switch(config)# logging 10.0.10.2
```

Enabling the syslog forwarding of messages with a severity of **err (4)** and above to TCP port 4242 on remote syslog server 10.0.10.9 with VRF **lab_vrf**:

```
switch(config)# logging 10.0.10.9 tcp 4242 severity err vrf lab_vrf
```

Disabling syslog forwarding to a remote syslog server:

```
switch(config)# no logging
```

Enabling syslog forwarding over TLS to a remote syslog server using subject-name authentication mode:

```
switch(config)#logging example.com tls auth-mode subject-name
```

Applying log filtering for syslog server forwarding:

```
switch(config)# logging 10.0.10.6 severity info filter filter_lldp_logs vrf mgmt
```

Applying log filtering and enabling the rate limit for syslog server forwarding over TCP port:

```
switch(config)# logging 10.0.10.2 tcp 3440 severity err vrf mgmt include-
auditable-events filter filter_lldp_logs rate-limit-burst 3 rate-limit-interval 35
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
|  | **The disable** parameter is introduced |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## logging accounting-format-native

```
logging accounting-format-native
[no] logging accounting-format-native
```

### Description

Change the accounting log message format to native Linux format. (Default: ArubaOS-CX format)

The 'no' form of this command will change the accounting log message format to ArubaOS-CX format.

### Usage

This option enables the switch to show all types of accounting records to the user. When configured, the same format will be used while sending messages to syslog servers. When upgrading from an earlier version of AOS-CX to AOS-CX 10.11 or later versions, if native accounting logs are preferred, then best practices is to issue this command as a part of the upgrade. If the switch upgrades from an earlier version to AOS-CX 10.11 or later without configuring this setting, by default, the accounting log message format will be ArubaOS-CX Format.

### Example

This example changes the accounting log message format to native Linux format.

```
switch(config)# logging accounting-format-native
```

The following example returns the accounting log message format to the default ArubaOS-CX format.

```
switch(config)# no logging accounting-format-native
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## logging filter

```
logging filter <FILTER-NAME>

   [{enable | disable}]

   [<SEQUENCE-ID>] {permit | deny} [event-id <EVENT-ID-RANGE>] [includes <REGEX>]
   [severity <COMPARISON-OPERATOR> <LEVEL>]

   no <SEQUENCE-ID>

   resequence <OLD-SEQUENCE-ID> <NEW-SEQUENCE-ID>

no logging filter <FILTER-NAME>
```

### Description

Creates a filter to restrict what event or debug logs are logged. A filter can be used to either permit or deny:

- The event logs from being generated on the switch, or
- The event or debug logs generated on the switch from being forwarded to a syslog server.

A filter is identified by a filter name and can have up to 20 rules or entries, each with a different sequence number, matching criteria, and corresponding action (deny or permit). When a filter is applied on a log, the log is matched against the criteria mentioned in the rules or entries in ascending numerical order of their sequence numbers until a matching entry is found. Once a matching entry is found, its corresponding action is applied on the log. If no matching rule is found, the default action (permit) is applied.

The **no** form of this command removes the filter.

| Parameter | Description |
|---|---|
| `<FILTER-NAME>` | Specifies the unique name to identify the filter. |
| `enable` | Filter event logs generated on the switch. |
| `<SEQUENCE-ID>` | Specifies the filter criteria sequence number. Default: Increments by 10 from the largest sequence-id currently used in this filter. |
| `deny` | Prevents the matching log from being logged. |
| `permit` | Allows the matching log. |
| `<event-id>` | Matches logs by event ID. Specify an event ID or a range of event IDs. It supports a maximum of 100 event IDs. |
| `includes <REGEX>` | Matches the log message against a regular expression string. |
| `severity` | Matches the logs by severity level.<br>The following options are used to compare the severity:<br>■ **eq**: Match events of severity equal to the specified.<br>■ **ge**: Match events of severity greater than or equal to the specified.<br>■ **gt**: Match events of severity greater than the specified.<br>■ **le**: Match events of severity lesser than or equal to the specified.<br>■ **lt**: Match events of severity lesser than the specified.<br>The following are the severity levels:<br>■ **alert**: Logs with the severity **alert (6)**.<br>■ **crit**: Logs with the severity **critical (5)**.<br>■ **debug**: Logs with the severity **debug (0)**.<br>■ **emerg**: Logs with the severity **emergency (7)**.<br>■ **err**: Logs with the severity **err (4)**.<br>■ **info**: Logs with the severity **info (1)**.<br>■ **notice**: Logs with the severity **notice (2)**.<br>■ **warning**: Logs with the severity **warning (3)**. |

## Usage

**Filtering event logs on the switch**: To permit or deny event logs from being generated on the switch. In this case, the matching event logs are filtered at generation. The denied event logs are neither logged to the switch events nor forwarded to any remote syslog servers. Multiple filters can be configured, but only one filter can be applied to filter the events on the switch. Such a filter can be chosen by adding the **enable** command under its configuration. Configuring the **enable** command under a new filter automatically removes it from the filter where it was previously used.

For example:

```
logging filter low_severity_logs

enable

10 deny severity lt info
```

This configuration denies the event logs which have a severity less than info.

If a filter contains **enable** command, it is not recommended to configure this filter in the **logging** command used for remote syslog server configuration. This is because, any event logs denied by the filter are already not available for forwarding to a remote server.

A filter with **enable** command will not affect debug logs. Consider the configuration in the following example of a filter with **enable** command and two rules applied **10 permit severity ge info** and **20 deny**. This implies permit only those event logs which have severity greater than or equal to **info**.

**Example:**

```
logging filter low_severity_logs
enable
10 permit severity ge info
20 deny
```

**Filtering event or debug logs when forwarding to a remote syslog server**: The filter name must be configured in the logging command that is used to configure remote syslog server. The logs will be generated on the switch and the filter only decides whether to deny or permit the syslog forwarding for the matching log. For example: **logging 10.0.10.6 filter filter_lldp_logs**

The filter affects debug logs only when the command **debug destination syslog** is configured on the switch.

The severity mentioned in the remote syslog server configuration using logging command under configuration context has more precedence than the severity mentioned in a filter entry. If a log with **warning** severity is permitted by a filter, but the remote syslog configuration has severity **err** mentioned in it, the log will not be forwarded to the remote syslog server (since warning(3) is lesser than err(4)). On the other hand, if a log with **err** severity is permitted by a filter and the remote syslog configuration has severity **warning** mentioned in it, the log will be forwarded to the remote syslog server.

## Examples

Configuring a new logging filter:

```
switch(config)# logging filter example_filter
```

To deny logs having event ID 1301 and a range of event IDs from 1305 to 1309:

```
switch(config-logging-filter)# 20 deny event-id 1301,1305-1309
```

To permit logs having event ID 1300:

```
switch(config-logging-filter)# 30 permit event-id 1300
```

To permit logs with severity greater than or equal to `err`:

```
switch(config-logging-filter)# 30 permit severity ge err
```

To deny logs with severity greater than info:

```
switch(config-logging-filter)# 30 deny severity gt info
```

To deny logs with event ID 1024 and a message matching the regular expression LLDP:

```
switch(config-logging-filter)# 40 deny event-id 1024 includes LLDP
```

Denying all logs:

```
switch(config-logging-filter)# 40 deny
```

Changing the sequence ID of an existing rule:

```
switch(config-logging-filter)# resequence 20 70
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` and `config-logging-filter` | Administrators or local user group members with execution rights for this command. |

# logging facility

```
logging facility {local0 | local1 | local2 | local3 | local4 | local5 | local6 | local7}
no logging facility
```

## Description

Sets the logging facility to be used for remote syslog messages. Default: `local7`

The **no** form of this command disables the logging facility to be used for remote syslog messages.

| Parameter | Description |
|---|---|
| `{local0 \| local1 \| local2 \| local3 \| local4 \| local5 \| local6 \| local7}` | Selects the logging facility to be used for remote syslog messages. Required.<br>Specifies the severity of the syslog messages:<br>■ **local0**<br>■ **local1**<br>■ **local2**<br>■ **local3**<br>■ **local4**<br>■ **local5**<br>■ **local6**<br>■ **local7** |

## Examples

Sets the local5 logging facility to be used for remote syslog messages:

```
switch(config)# logging facility local5
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# logging persistent-storage

```
logging persistent-storage [severity {alert|crit|debug|emerg|err|info|notice|warning}]
no logging persistent-storage
```

## Description

Enables or disables storage of logs in storage. Only logs of the specified severity and above will be preserved in the storage.

The **no** form of this command disables storage of logs in storage.

| Parameter | Description |
|---|---|
| `severity <LEVEL>` | Specifies the severity of the syslog messages:<br>▪ **alert**: Preserves syslog messages with the severity of **alert (6)** and **emergency (7)**<br>▪ **crit**: Preserves syslog messages with the severity of **critical (5)** and above. Default.<br>▪ **debug**: Preserves syslog messages with the severity of **debug (0)** and above.<br>▪ **emerg**: Preserves syslog messages with the severity of **emergency (7)** only.<br>▪ **err**: Preserves syslog messages with the severity of **err (4)** and above.<br>▪ **info**: Preserves syslog messages with the severity of **info (1)** and above.<br>▪ **notice**: Preserves syslog messages with the severity of **notice (2)** and above.<br>▪ **warning**: Preserves syslog messages with the severity of **warning (3)** and above. |

## Usage

These logs can be copied out by using the **copy support-files all** or **copy support-files previous-boot**.

## Examples

Enabling storage of logs in storage with severity **info**:

```
switch(config)#logging persistent-storage severity info
Logs will be written to storage and made available across reboot.
Do you want to continue (y/n)?
```

Disabling storage of logs in storage:

```
switch(config)# no logging persistent-storage
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# Chapter 134

# RIPv2 (IPv4) commands

## Configuration commands

### router rip

```
router rip <PROCESS-ID> [vrf <VRF-NAME>]
no router rip <PROCESS-ID> [vrf <VRF-NAME>]
```

#### Description

Creates RIP process if not already created and enters the **router rip <PROCESS-ID>** context for the VRF mentioned. If no VRF is mentioned, a default is used. Only one RIP process is allowed per VRF.

The **no** form of this command deletes the RIP instance for the VRF. If no VRF is mentioned the default is deleted.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies name of the RIP process ID. Range: 1-63. |
| *vrf <VRF-NAME>* | Specifies VRF name. |

#### Examples

Creating RIP process and naming the VRF:

```
switch(config)# router rip 2 vrf red
```

Deleting RIP process:

```
switch(config)# no router rip 2 vrf red
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

#### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

#### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# Interface commands

## ip rip

```
ip rip <PROCESS-ID> {all-ip | ip-address}
no ip rip <PROCESS-ID> {all-ip | ip-address}
```

### Description

Enables RIP process on an interface.

The **no** form of this command deletes the RIP process from an interface.

| Parameter | Description |
|---|---|
| `ip rip <PROCESS-ID>` | Specifies RIP process ID. Range: 1-63. |
| `all-ip` | Specifies RIP for all IP addresses configured on the interface. |
| `ip-address` | Specifies IP address for RIP on the interface. |

### Usage

- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.
- If **ip rip *1* all-ip** is configured and a new IP address is added to the interface, RIP configurations will not be applicable for the newly added IP address.

### Examples

Configuring RIP for all IP addresses configured on the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 all-ip
```

Deleting RIP for all IP addresses configured on the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip rip 1 all-ip
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## ip rip all-ip enable

```
ip rip all-ip enable
no ip rip all-ip enable
```

### Description

Enables RIP process for all RIP enabled IP addresses configured on interface.

The **no** form of this command disables RIP process on the interface.

### Usage

- Default settings allow an interface to receive RIP packets.
- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.

### Examples

Enabling RIP process for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip all-ip enable
```

Disabling RIP process on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip rip all-ip enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## ip rip all-ip disable

```
ip rip all-ip disable
no ip rip all-ip disable
```

### Description

Disables RIP process for all RIP enabled IP addresses configured on the interface.

The **no** form of this command enables RIP process for all RIP enabled IP addresses configured on the interface.

### Usage

- Default settings allow an interface to receive RIP packets.
- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.

### Examples

Disabling RIP process for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip all-ip enable
```

Enabling RIP process for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip rip all-ip enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

# ip rip all-ip send disable

```
ip rip all-ip send disable
no ip rip all-ip send disable
```

## Description

Disables interface from sending RIP packets for all RIP enabled IP addresses.

The **no** form of this command enables interface to send RIP packets for all RIP enabled IP addresses.

## Usage

- Default settings allow an interface to send RIP packets.
- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.

## Examples

Disabling interface from sending RIP packets for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip all-ip send disable
```

Enabling interface to send RIP packets for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip rip all-ip send disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

# ip rip all-ip receive disable

```
ip rip all-ip receive disable
no ip rip all-ip receive disable
```

## Description

Disables interface from receiving RIP packets for all enabled IP addresses.

The **no** form of this command enables interface to receive RIP packets for all RIP enabled IP addresses.

### Usage

- Default settings allow an interface to receive RIP packets.
- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.

### Examples

Disabling interface from receiving RIP packets for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip all-ip receive disable
```

Enabling interface to receive RIP packets for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip rip all-ip receive disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

# Routing commands

## enable

```
enable
no enable
```

### Description

Enables RIP process if disabled. By default RIP process is enabled.

The **no** form of this command disables the RIP process.

### Examples

Enabling RIP process when disabled:

```
switch(config)# router rip 1
switch(config-rip-1)# enable
```

Disabling RIP process when enabled:

```
switch(config)# router rip 1
switch(config-rip-1)# no enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## disable

```
disable
no disable
```

### Description

Disables RIP process.

The **no** form of this command enables the RIP process.

### Examples

Disabling RIP process:

```
switch(config)# router rip 1
switch(config-rip-1)# disable
```

Enabling RIP process:

```
switch(config)# router rip 1
switch(config-rip-1)# no disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## distance

```
distance <DISTANCE>
no distance
```

### Description

Configures administrative distance for RIP. Administrative distance is used as criteria to select the best route when multiple protocols have the same route.

The **no** form of this command sets the RIP administrative distance to the default. Default: 120.

| Parameter | Description |
|---|---|
| *<DISTANCE>* | Specifies RIP administrative distance. Range: 1 to 255. |

### Examples

Configuring administrative distance for RIP:

```
switch(config)# router rip 1
switch(config-rip-1)# distance 100
```

Setting administrative distance for RIP to default values:

```
switch(config)# router rip 1
switch(config-rip-1)# no distance
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## maximum-paths

```
maximum-paths <MAX-VALUE>
no maximum-paths
```

### Description

Sets the maximum number of ECMP routes that RIP can support.

The **no** form of this command sets the maximum number of ECMP routes to the default value of 4.

| Parameter | Description |
|---|---|
| *<MAX-VALUE>* | Sets the number of RIP ECMP routes. Range: 1-8. |

### Examples

Setting maximum number of RIP ECMP routes:

```
switch(config)# router rip 1
switch (config-rip-1)# maximum-paths 8
```

Setting maximum number of RIP ECMP routes to default:

```
switch(config)# router rip 1
switch (config-rip-1)# no maximum-paths
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## redistribute

```
redistribute {bgp | connected | ospf <PROCESS-ID> | static}
no redistribute {bgp | connected | ospf <PROCESS-ID> | static}
```

### Description

Redistributes routes originating from other protocols into RIP.

The **no** form of this command disables redistribution of routes originating from other protocols into RIP.

| Parameter | Description |
|---|---|
| `bgp` | Specifies BGP routes to redistribute into RIP. |
| `connected` | Specifies connected routes (directly attached subnet or host) to redistribute into RIP. |
| `ospf` *`<PROCESS-ID>`* | Specifies the OSPF route to redistribute into RIP. Range: <1-65535> |
| `static` | Specifies static route to redistribute into RIP. |

### Examples

Redistributing BGP routes into RIP:

```
switch(config)# router rip 1
switch(config-rip-1)# redistribute bgp
```

Disabling BGP routes that originate from other protocols and redistribute into RIP:

```
switch(config)# router rip 1
switch(config-rip-1)# no redistribute bgp
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Supported process ID range expanded from 1-63 to 1-65535. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## timers update

```
timers update <INTERVAL> timeout <DURATION> garbage-collection <PERIOD>
no timers
```

### Description

Configures RIP timers with specific values.

The **no** form of this command sets all RIP timers to default values.

| Parameter | Description |
|---|---|
| `timers update <INTERVAL>` | Specifies frequency at which RIP sends updates to all of its peers. Range: 1 to 2147484. Default: 30. |
| `timeout <DURATION>` | Specifies timeout duration from the point of the last refresh after a route is received from a peer timeout and is marked as expired. Range: 1 to 255. Default: 180. |
| `garbage-collection <PERIOD>` | Specifies amount of time route remains in routing table after route expiration. Range: 1 to 255. Default: 120. |

### Examples

Configuring RIP timers with specific values:

```
switch(config)# router rip 1
switch(config-rip-1)# timers update 40 timeout 200 garbage-collection 150
```

Configuring RIP timers with default values:

```
switch(config)# router rip 1
switch(config-rip-1)# no timers
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# RIPv2 clear commands

## clear ip rip statistics

`clear ip rip [<PROCESS-ID>] statistics [all-vrfs | vrf <VRF-NAME>]`

### Description

Clears RIP event statistics.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIP process ID. Range: 1-63 |
| all-vrfs | Clears statistics for all VRFs. |
| vrf | Selects VRF to clear statistics for. |
| *<VRF-NAME>* | Specifies VRF name. |

### Examples

Clearing RIP event statistics:

```
switch# clear ip rip statistics
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# RIPv2 interface commands

## enable

```
enable
no enable
```

### Description

Enables RIP process for RIP enabled IP address configured on interface.

The **no** form of this command disables RIP process on interface.

### Usage

- Default settings allow an interface to receive RIP packets.
- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.

### Examples

Enabling RIP process for RIP enabled IP address:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# enable
```

Disabling RIP process on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# no enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## disable

```
disable
no disable
```

### Description

Disables RIP process for RIP enabled IP addresses configured on interface.

The **no** form of this command enables RIP process on interface.

### Examples

Disabling RIP process for RIP enabled IP addresses configured on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# disable
```

Enabling RIP process on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# no disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## send disable

```
send disable
no send disable
```

### Description

Disables an interface from sending RIP packets for a specific IP address.

The **no** form of this command enables interface for sending RIP packets for a specific IP address.

### Usage

- Default settings allow an interface to send and receive RIP packets.
- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.

### Examples

Disabling interface from sending RIP packets for a specific IP address :

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# send disable
```

Enabling interface to send RIP packets for a specific IP address:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# no send disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## receive disable

```
receive disable
no receive disable
```

### Description

Disables interface from receiving RIP packets for a specific IP address.

The **no** form of this command enables interface for receiving RIP packets for a specific IP address.

### Usage

- Default settings allow an interface to receive RIP packets.
- If an IP address is removed from an interface configured with RIP, all RIP configurations will be removed from the interface.

### Examples

Disabling interface from receiving RIP packets for a specific IP address:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# receive disable
```

Enabling interface for receiving RIP packets for a specific IP address:

```
switch(config)# interface 1/1/1
switch(config-if)# ip rip 1 10.1.1.1
switch(config-if-rip)# no receive disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

# RIPv2 show commands

## show capacities rip

```
show capacities rip
```

### Description

Displays maximum number of RIP interfaces, routes and process.

### Examples

Displaying maximum number of RIP interfaces, routes and process:

```
switch# show capacities rip

System Capacities: Filter RIP
Capacities Name                                                             Value
----------------------------------------------------------------------------------
Maximum number of RIP interfaces configurable in the system                 32
Maximum number of RIP processes supported across each VRF                   1
Maximum number of routes in RIP supported across all VRFs                   2540
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show capacities-status rip

```
show capacities-status rip
```

### Description

Displays number of RIP interfaces, routes and process configured in the system.

## Examples

Displaying number of RIP interfaces, routes and process:

```
switch# show capacities-status rip

System Capacities Status: Filter RIP
Capacities Name                                          Value Maximum
----------------------------------------------------------------------
Number of RIP interfaces configured in the system            0      32
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

# show ip rip

```
show ip rip [<PROCESS-ID>] [all-vrfs | vrf <VRF-NAME>]
```

## Description

Displays general RIP configuration.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIP process ID. Range: 1-63. |
| all vrfs | Displays general RIP information for all VRFs. |
| vrf | Selects VRF to display general RIP information for. |
| *<VRF-NAME>* | Specifies VRF name. |

## Usage

- Parameters display general RIP information for a specific RIP process.
- Parameters display general RIP information for a specific or all VRFs.
- If a VRF is not mentioned, information for the default VRF is displayed.

## Examples

Displaying general RIP configuration for all VRFs:

```
switch# show ip rip 34 all-vrfs
VRF : Default                       Process-ID : 34
---------------------------------------------------------------------
RIP Version             : RIPv2     Protocol Status : Enabled
Update Time             : 60  sec   Timeout Time    : 240 sec
Garbage Collection Time : 250 sec   ECMP            : 6
Distance                : 100       Redistribution  : static,
                                                      ospf 1

VRF : vrf_1                         Process-ID : 34
---------------------------------------------------------------------
RIP Version             : RIPv2     Protocol Status : Enabled
Update Time             : 30  sec   Timeout Time    : 180 sec
Garbage Collection Time : 120 sec   ECMP            : 4
Distance                : 120       Redistribution  : None
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ip rip interface

show ip rip [*<PROCESS-ID>*] interface [*<INTERFACE-NAME>*] [brief] [all-vrfs | vrf *<VRF-NAME>*]

### Description

Displays information about RIP enabled interfaces.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIP process ID. Range: 1-63. |
| *<INTERFACE-NAME>* | Specifies interface. |
| brief | Shows brief overview information for the RIP interface. |
| all-vrfs | Displays interface information for all VRFs. |

| Parameter | Description |
|---|---|
| `vrf` | Selects specific VRF. |
| *<VRF-NAME>* | Specifies VRF. |

## Usage

- Parameters display general RIP information for a specific RIP process.
- If a VRF is not mentioned, information for the default VRF is displayed.

## Examples

```
switch# show ip rip interface
Interface 1/1/1 is up, IP Address is 10.10.10.1/24
-----------------------------------------------------------------------
VRF             : Default            Process-ID     : 1
Status          : Oper Up            Mode           : Send and Receive
MTU             : 500                Version        : RIPv2
Poision Reverse : Enabled

Interface 1/1/2 is up, IP Address is 20.10.10.1/24
-----------------------------------------------------------------------
VRF             : Default            Process-ID     : 1
Status          : Admin Down         Mode           : Receive
MTU             : 500                Version        : RIPv2
Poision Reverse : Enabled

Interface 1/1/3 is up, IP Address is 30.10.10.1/24
-----------------------------------------------------------------------
VRF             : Default            Process-ID     : 1
Status          : Admin Down         Mode           : Send
MTU             : 500                Version        : RIPv2
Poision Reverse : Enabled

switch# show ip rip interface brief
VRF : default   Process-ID : 1
-------------------------------

Total Number of Interfaces: 2

Interface     IP-Address/Mask    Status    MTU
--------------------------------------------------
1/1/1         10.10.10.1/24       up       500
1/1/2         20.10.10.1/24       up       500
1/1/3         30.10.10.1/24       up       500
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ip rip neighbors

`show ip rip [<PROCESS-ID>] neighbors [<IP-ADDRESS>] [all-vrfs | vrf <VRF-NAME>]`

### Description

Displays information about RIP neighbors.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIP process ID. Range: 1-63. |
| *<IP-ADDRESS>* | Specifies IP address of a specific neighbor to display information on. |
| `all-vrfs` | Displays neighbor information for all VRFs. |
| `vrf` | Selects VRF to display neighbor information. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- Parameters display RIP neighbor information for a specific RIP process.
- Parameters display RIP neighbor information for a specific neighbor.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIP neighbor information for all VRFs:

```
switch# show ip rip neighbors all-vrfs
VRF : default            Process-ID : 1
----------------------------------------

Total Number of Neighbors: 1

Peer-Address   Type    Last-Update  Rcvd-Bad-Pkts    Rcvd-Bad-Routes
------------------------------------------------------------------
1.1.1.2        RIPv2   0:0:7        4                5
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ip rip routes

```
show ip rip [<PROCESS-ID>] routes [<PREFIX/LENGTH>] [all-vrfs | vrf <VRF-NAME>]
```

### Description

Displays RIP routing table for a specific RIP process.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIP process ID to display information for a specific RIP process. Range: 1-63. |
| *<PREFIX/LENGTH>* | Specifies the network prefix. |
| all-vrfs | Displays RIP routing information for all VRFs. |
| vrf | Selects VRF to display RIP routing information. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- *<PREFIX/LENGTH>* is an optional parameter that displays RIP routing table information for a specific subnet.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIP routing table for all VRFs:

```
switch# show ip rip routes all-vrfs
VRF : default              Process-ID : 1
----------------------------------------
Total Number of Routes : 6

Prefix              Metric     Interface      Nexthop
--------------------------------------------------------
10.1.0.0/16           2          1/1/1         30.1.1.2
20.1.2.0/24           3          1/1/1         30.1.1.2
30.1.1.0/24           1          1/1/1

VRF : vrf_1                Process-ID : 34
----------------------------------------

Prefix               Metric     Interface      Nexthop
--------------------------------------------------------
20.1.0.0/16           10         1/1/2          50.1.1.2
```

```
40.1.2.0/24          14        1/1/2         50.1.1.2
50.1.1.0/24           1        1/1/2

```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ip rip statistics

```
show ip rip [<PROCESS-ID>] statistics [all-vrfs | vrf <VRF-NAME>]
```

### Description

Displays RIP statistics.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIP process ID. Range: 1-63. |
| all-vrfs | Displays statistics information for all VRFs. |
| vrf | Selects VRF to display RIP statistics information for. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- Parameters can display information for all VRFs or a specific VRF.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIP statistics for all VRFs:

```
switch# show ip rip statistics all-vrfs
VRF : default  Process-ID : 1
-------------------------------------

Global Route Changes : 50
Global Queries       : 2
```

```
Last Cleared         : 0h 30m 28s ago

VRF : vrf_1    Process-ID : 34
-------------------------------------

Global Route Changes : 20
Global Queries       : 0
Last Cleared         : 0h 30m 28s ago
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ip rip statistics interface

`show ip rip [<PROCESS-ID>] statistics interface [<INTERFACE-NAME>] [all-vrfs | vrf <VRF-NAME>]`

### Description

Displays RIP statistics for RIP enabled interfaces.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIP process ID. Range: 1-63. |
| *<INTERFACE-NAME>* | Specifies name of interface. |
| `all-vrfs` | Displays RIP interface statistics for all VRFs. |
| `vrf` | Selects VRF to display RIP interface statistics. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- Parameters can display information for all VRFs or a specific VRF.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIP statistics for a RIP enabled interface:

```
switch# show ip rip statistics interface 1/1/1
VRF : default  Process-ID : 1      interface 1/1/1
--------------------------------------------------

IP-Address    Trigger-Updates    Rcvd-Bad-Packets    Rcvd-Bad-Routes
-----------------------------------------------------------------------
10.1.1.1      15                 3                   4

Last Cleared : 0h 30m 28s ago
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show running-config

```
show running config
```

### Description

Displays all running configurations for all protocols including RIP.

### Examples

Displaying all running configurations for all protocols including RIP:

```
switch# show running-config
Current configuration:
!
!Version Halon 0.1.0 (Build: genericx86-64-Halon-0.1.0-master-20170309054955-dev)
!Schema version 0.1.8
lldp enable
timezone set utc
vrf blue
vrf green
vrf red
led base-loc_fdc on
led base-loc on
led base-hlth_fdc fast_blink
led base-pwr_fdc on
!
!
!
```

```
!
!
!
aaa authentication login default local
aaa authorization commands default none
!
!
!
!
router ospf 1 vrf red
router rip 1
    maximum-paths 5
    distance 1
router rip 1 vrf red
    default-information originate always
    maximum-paths 7
    distance 5
    redistribute ospf 1
    timers update 40 timeout 200 garbage-collection 120
vlan 1
    no shutdown
interface lag 44
    no shutdown
    ip address 33.1.1.1/24
    ip rip 1 33.1.1.1
        send disable
interface 1/1/1
    no shutdown
    ip address 33.44.1.1/24
    ip address 44.44.1.1/24 secondary
    ip rip 1 33.44.1.1
        send disable
    ip rip 1 44.44.1.1
        send disable
interface 1/1/2
interface loopback 2
    ip address 55.55.55.55/32
    ip rip 1 55.55.55.55
```

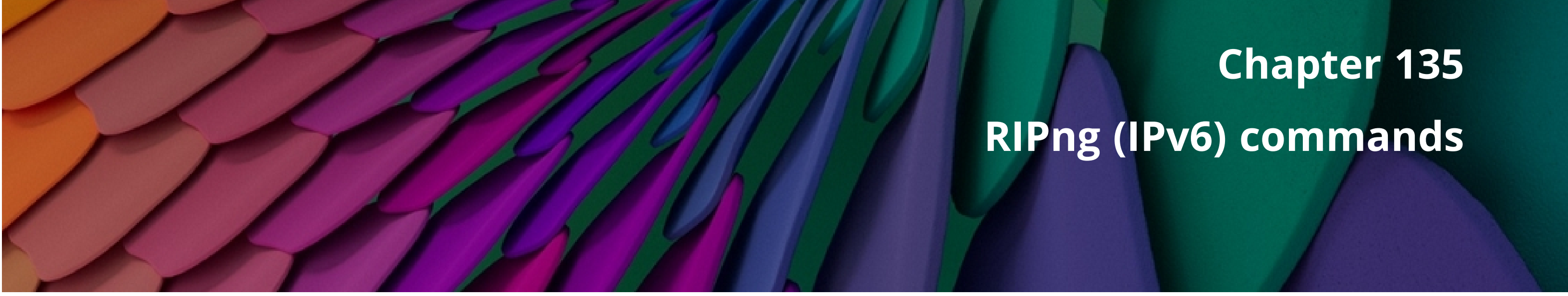
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |



# Chapter 135

# RIPng (IPv6) commands

## Configuration commands

### router ripng

```
router ripng <PROCESS-ID> [vrf <VRF-NAME>]
no router ripng <PROCESS-ID> [vrf <VRF-NAME>]
```

#### Description

Creates RIPng process if not already created and enters the **router ripng <PROCESS-ID>** context for the VRF mentioned. If no VRF is mentioned, a default is used. Only one RIPng process is allowed per VRF.

The **no** form of this command deletes the RIPng instance for the VRF. If no VRF is mentioned the default is deleted.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies name of the RIPng process ID. Range: <1-63> |
| vrf | Sets VRF name for RIPng process. |
| *<VRF-NAME>* | VRF name for VRF. |

#### Examples

Creating RIPng process and naming the VRF:

```
switch(config)# router ripng 2 vrf red
```

Deleting RIPng process:

```
switch(config)# no router ripng 2 vrf red
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

#### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

#### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# Interface commands

## ipv6 ripng

```
ipv6 ripng <PROCESS-ID>
no ipv6 ripng <PROCESS-ID>
```

### Description

Enables RIPng process on interface and creates a new context.

The **no** form of this command deletes RIPng process on interface.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID. Range: 1-63. |

### Examples

Enabling RIPng process on an interface:

```
switch(config)# interface 1/1/1
switch (config-if)# ipv6 ripng 1
switch (config-if-ripng)#
```

Deleting RIPng process on an interface:

```
switch(config)# interface 1/1/1
switch (config-if)# no ipv6 ripng 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

# Routing commands

## enable

```
enable
no enable
```

### Description

Enables RIPng process if disabled. By default RIPng process is enabled.

The **no** form of this command disables the RIPng process.

### Examples

Enabling RIPng process when disabled:

```
switch(config)# router ripng 1
switch(config-ripng-1)# enable
```

Disabling RIPng process when enabled:

```
switch(config)# router ripng 1
switch(config-ripng-1)# no enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config | Administrators or local user group members with execution rights for this command. |

## disable

```
disable
no disable
```

### Description

Disables RIPng process.

The **no** form of this command enables the RIPng process.

### Examples

Disabling RIPng process:

```
switch(config)# router ripng 1
switch(config-ripng-1)# disable
```

Enabling RIPng process:

```
switch(config)# router ripng 1
switch(config-ripng-1)# no disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## distance

```
distance <DISTANCE>
no distance
```

### Description

Configures administrative distance for RIPng. Administrative distance is used as criteria to select the best route when multiple protocols have the same route.

The **no** form of this command sets the RIPng administrative distance to the default. Default: 120.

| Parameter | Description |
|---|---|
| *<DISTANCE>* | Specifies RIPng administrative distance. Range: 1 to 255. |

### Examples

Configuring administrative distance for RIPng:

```
switch(config)# router ripng 1
switch(config-ripng-1)# distance 100
```

Setting administrative distance for RIPng to default values:

```
switch(config)# router ripng 1
switch(config-ripng-1)# no distance
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## maximum-paths

```
maximum-paths <MAX-VALUE>
no maximum-paths
```

### Description

Sets the maximum number of ECMP routes that RIPng can support.

The **no** form of this command sets the maximum number of ECMP routes to the default value of 4.

| Parameter | Description |
|---|---|
| *<MAX-VALUE>* | Sets the number of RIPng ECMP routes. Range: 1-8. |

### Examples

Setting maximum number of RIPng ECMP routes:

```
switch(config)# router ripng 1
switch (config-ripng-1)# maximum-paths 8
```

Setting maximum number of RIPng ECMP routes to default:

```
switch(config)# router ripng 1
switch (config-ripng-1)# no maximum-paths
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## redistribute

```
redistribute {bgp | connected | ospfv3 <PROCESS-ID> | static}
no redistribute {bgp | connected | ospfv3 <PROCESS-ID> | static}
```

### Description

Redistributes routes originating from other protocols into RIPng.

The **no** form of this command disables redistribution of routes originating from other protocols into RIPng.

| Parameter | Description |
|---|---|
| `bgp` | Specifies BGP routes to redistribute into RIPng. |
| `connected` | Specifies connected routes (directly attached subnet or host) to redistribute into RIPng. |
| `ospfv3 <PROCESS-ID>` | Specifies the OSPFv3 route to redistribute into RIPng. Range: <1-65535> |
| `static` | Specifies static route to redistribute into RIPng. |

### Examples

Redistributing BGP routes into RIPng:

```
switch(config)# router ripng 1
switch(config-ripng-1)# redistribute bgp
```

Disabling BGP routes that originate from other protocols and redistribute into RIPng:

```
switch(config)# router ripng 1
switch(config-ripng-1)# no redistribute bgp
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Supported process ID range expanded from 1-63 to 1-65535. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## timers update

```
timers update <INTERVAL> timeout <DURATION> garbage-collection <PERIOD>
no timers
```

### Description

Configures RIPng timers with specific values.

The **no** form of this command sets all RIPng timers to default values.

| Parameter | Description |
|---|---|
| `timers update <INTERVAL>` | Specifies frequency at which RIPng sends updates to all of its peers. Range: 1 to 2147484. Default: 30. |
| `timeout <DURATION>` | Specifies timeout duration from the point of the last refresh after a route is received from a peer timeout and is marked as expired. Range: 1 to 255. Default: 180. |
| `garbage-collection <PERIOD>` | Specifies amount of time route remains in routing table after route expiration. Range: 1 to 255. Default: 120. |

### Examples

Configuring RIPng timers with specific values:

```
switch(config)# router ripng 1
switch(config-ripng-1)# timers update 40 timeout 200 garbage-collection 150
```

Configuring RIPng timers with default values:

```
switch(config)# router ripng 1
switch(config-ripng-1)# no timers
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# RIPng clear commands

## clear ipv6 ripng statistics

```
clear ipv6 ripng [<PROCESS-ID>] statistics [all-vrfs | vrf <VRF-NAME>]
```

### Description

Clears RIPng event statistics.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID. Range: 1-63 |
| `all-vrfs` | Clears statistics for all VRFs. |
| `vrf` | Selects VRF to clear statistics for. |
| *<VRF-NAME>* | Specifies VRF name. |

### Examples

Clearing RIPng event statistics:

```
switch# clear ipv6 ripng statistics
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# RIPng interface commands

## enable

```
enable
no enable
```

### Description

Enables RIPng process on interface.

The **no** form of this command disables RIPng process on interface.

### Examples

Enabling RIPng process on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 ripng 1
switch(config-if-ripng)# enable
```

Disabling RIPng process on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 ripng 1
switch(config-if-ripng)# no enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## disable

```
disable
no disable
```

### Description

Disables RIPng process on interface.

The **no** form of this command enables RIPng process on interface.

### Examples

Disabling RIP process for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 ripng 1
switch(config-if-ripng)# disable
```

Enabling RIP process for all RIP enabled IP addresses on interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 ripng 1
switch(config-if-ripng)# no disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## send disable

```
send disable
no send disable
```

### Description

Disables interface from sending RIPng packets. An interface can send RIPng packets by default.

The **no** form of this command enables interface to send RIPng packets, if disabled.

### Examples

Disabling interface from sending RIPng packets:

```
switch(config)# interface 1/1/1
switch (config-if)# ipv6 ripng 1
switch (config-if-ripng)# send disable
```

Enabling interface to send RIPng packets:

```
switch(config)# interface 1/1/1
switch (config-if)# ipv6 ripng 1
switch (config-if-ripng)# no send disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## receive disable

```
receive disable
no receive disable
```

### Description

Disables interface from receiving RIPng packets for all enabled IP addresses. An interface can receive RIPng packets by default.

The **no** form of this command enables interface to receive RIPng packets, if disabled.

### Examples

Disabling interface from receiving RIPng packets:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 ripng 1
switch (config-if-ripng)# receive disable
```

Enabling interface to receive RIPng packets when disabled:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 ripng 1
switch (config-if-ripng)# no receive disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

# RIPng show commands

## show capacities ripng

```
show capacities ripng
```

### Description

Displays the maximum number of RIPng interfaces, routes and process.

### Examples

Displaying maximum number of RIPng interfaces, routes and process:

```
switch# show capacities ripng

System Capacities: Filter RIPng
Capacities Name                                                       Value
----------------------------------------------------------------------------
Maximum number of RIPng interfaces configurable in the system         32
Maximum number of RIPng processes supported across each VRF           1
Maximum number of routes in RIPng supported across all VRFs           2540
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show capacities-status ripng

```
show capacities-status ripng
```

### Description

Displays number of RIPng interfaces, routes and process configured in the system.

### Examples

Displaying number of RIPng interfaces, routes and process:

```
switch# show capacities-status ripng

System Capacities Status: Filter RIPng
Capacities Name
          Value  Maximum
----------------------------------------------------------------------------------
-------------------------
Number of RIPng interfaces configured in the system
              0       32
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ipv6 ripng

```
show ipv6 ripng [<PROCESS-ID>] [all-vrfs | vrf <VRF-NAME>]
```

### Description

Displays general RIPng configuration.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID. Range: 1-63. |
| `all vrfs` | Displays general RIPng information for all VRFs. |
| `vrf` | Selects VRF to display general RIPng information for. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- Parameters display general RIPng information for a specific RIPng process.
- Parameters display general RIPng information for a specific or all VRFs.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying general RIPng configuration for all VRFs:

```
switch# show ipv6 ripng 34 all-vrfs
VRF : Default                       Process-ID : 34
---------------------------------------------------------------------
Protocol Status         : Enabled   ECMP            : 6
Update Time             : 60   sec  Timeout Time    : 240 sec
Garbage Collection Time : 250 sec   Distance        : 100
Redistribution          : static,
                          ospfv3 1

VRF : vrf_1                         Process-ID : 34
---------------------------------------------------------------------
Protocol Status         : Enabled   ECMP            : 4
Update Time             : 30   sec  Timeout Time    : 180 sec
Garbage Collection Time : 120 sec   Distance        : 120
Redistribution          : None
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ipv6 ripng interface

`show ipv6 ripng [<PROCESS-ID>] interface [<INTERFACE-NAME>] [brief] [all-vrfs | vrf <VRF-NAME>]`

### Description

Displays information about RIPng enabled interfaces.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID. Range: 1-63. |

| Parameter | Description |
|---|---|
| *<INTERFACE-NAME>* | Specifies interface. |
| brief | Shows brief overview information for RIPng interface. |
| all-vrfs | Displays interface information for all VRFs. |
| vrf | Selects specific VRF. |
| *<VRF-NAME>* | Specifies VRF. |

## Usage

- Parameters display general RIPng information for a specific RIPng process.
- Parameters display general RIPng information for a specific or all VRFs.
- If a VRF is not mentioned, information for the default VRF is displayed.

## Examples

```
switch# show ipv6 ripng interface
Interface 1/1/1 is up, IPv6 Address is fe80::7272:cfff:fe70:67a
-----------------------------------------------------------------------
VRF             : Default            Process-ID      : 1
Status          : Oper Up            Mode            : Send and Receive
MTU             : 500                Poision Reverse : Enabled

Interface 1/1/2 is up, IPv6 Address is fe80::7272:cfff:fe70:67a
-----------------------------------------------------------------------
VRF             : Default            Process-ID      : 1
Status          : Admin Down         Mode            : Receive
MTU             : 500                Poision Reverse : Enabled

Interface 1/1/3 is up, IPv6 Address is fe80::7272:cfff:fe70:67a
-----------------------------------------------------------------------
VRF             : Default            Process-ID      : 1
Status          : Admin Down         Mode            : Send
MTU             : 500                Poision Reverse : Enabled

switch# show ipv6 ripng interface brief
VRF : default   Process-ID : 1
-------------------------------

Total Number of Interfaces: 2

Interface     IPv6-Address                   Status    MTU
-----------------------------------------------------------
1/1/1         fe80::7272:cfff:fe70:67a       up        500
1/1/2         fe80::7272:cfff:fe71:67a       up        500
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ipv6 ripng neighbors

`show ipv6 ripng [<PROCESS-ID>] neighbors [<LINK-LOCAL-ADDRESS>] [all-vrfs | vrf <VRF-NAME>]`

### Description

Displays information about RIPng neighbors.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID. Range: 1-63. |
| `neighbors` | Specifies neighbor IP address. |
| *<LINK-LOCAL-ADDRESS>* | Specifies link-local address. |
| `all-vrfs` | Displays neighbor information for all VRFs. |
| `vrf` | Selects VRF to display neighbor information. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- Parameters display RIPng neighbor information for a specific RIPng process.
- Parameters display RIPng neighbor information for a specific neighbor.
- Parameters display general RIPng information for a specific or all VRFs.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIPng neighbor information for all VRFs:

```
switch# show ipv6 ripng neighbors all-vrfs
VRF : default            Process-ID : 1
----------------------------------------

Total Number of Neighbors: 1

Peer-Address      Type    Last-Update  Rcvd-Bad-Pkts    Rcvd-Bad-Routes
----------------------------------------------------------------------
```

```
fe80::7272:cfff:fe70:86ae
                 RIPng   0:0:7        4                5
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ipv6 ripng routes

```
show ipv6 ripng [<PROCESS-ID>] routes [<PREFIX/LENGTH>] [all-vrfs | vrf <VRF-NAME>]
```

### Description

Displays RIPng routing table for a specific RIPng process.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID to display information for a specific RIPng process. Range: 1-63. |
| *<PREFIX/LENGTH>* | Specifies the network prefix. |
| all-vrfs | Displays RIPng routing information for all VRFs. |
| vrf | Selects VRF to display RIPng routing information. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- *<PREFIX/LENGTH>* is an optional parameter that displays RIPng routing table information for a specific subnet.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIPng routing table for all VRFs:

```
switch# show ipv6 ripng routes all-vrfs
VRF : default              Process-ID : 1
------------------------------------------

Prefix              Metric     Interface      Nexthop
-----------------------------------------------------------------------
2001:DB8:10::/64      2         1/1/1         FE80::2E0:E6FF:FE1B:8242
2002:DB8:10::/64      3         1/1/1         FE80::2E0:E6FF:FE1B:8242
2003:DB8:10::/64      1         1/1/1

VRF : vrf_1                Process-ID : 34
-------------------------------------------

Prefix               Metric     Interface      Nexthop
------------------------------------------------------------------------
3001:DB8:10::/64      10         1/1/2         FE80::2E0:E6FF:FE1B:8232
3002:DB8:10::/64      14         1/1/2         FE80::2E0:E6FF:FE1B:8232
3003:DB8:10::/64       1         1/1/2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ipv6 ripng statistics

`show ipv6 ripng [<PROCESS-ID>] statistics [all-vrfs | vrf <VRF-NAME>]`

### Description

Displays RIPng statistics.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID. Range: 1-63. |
| all-vrfs | Displays statistics information for all VRFs. |
| vrf | Selects VRF and displays RIPng statistics for it. |
| *<VRF-NAME>* | Specifies VRF name. |

### Usage

- Parameters can display information for all VRFs or a specific VRF.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIPng statistics for all VRFs:

```
switch# show ipv6 ripng statistics all-vrfs
VRF : default  Process-ID : 1
-------------------------------------

Global Route Changes : 50
Global Queries       : 2
Last Cleared         : 0h 30m 28s ago

VRF : vrf_1    Process-ID : 34
-------------------------------------

Global Route Changes : 20
Global Queries       : 0
Last Cleared         : 0h 30m 28s ago
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show ipv6 ripng statistics interface

`show ipv6 ripng [<PROCESS-ID>] statistics interface [<INTERFACE-NAME>] [all-vrfs | vrf <VRF-NAME>]`

### Description

Displays RIPng statistics for RIPng enabled interfaces.

| Parameter | Description |
|---|---|
| *<PROCESS-ID>* | Specifies RIPng process ID. Range: 1-63. |
| *<INTERFACE-NAME>* | Specifies name of interface. |

| Parameter | Description |
|---|---|
| `all-vrfs` | Displays RIPng interface statistics for all VRFs. |
| `vrf` | Selects VRF to display RIPng interface statistics. |
| *`<VRF-NAME>`* | Specifies VRF name. |

### Usage

- Parameters can display information for all VRFs or a specific VRF.
- If a VRF is not mentioned, information for the default VRF is displayed.

### Examples

Displaying RIPng statistics for a RIPng enabled interface:

```
switch# show ipv6 ripng statistics interface 1/1/1
VRF : default  Process-ID : 1      interface 1/1/1
--------------------------------------------------

IPv6-Address         Trigger-Updates    Rcvd-Bad-Packets    Rcvd-Bad-Routes
-----------------------------------------------------------------------------
fe80::7272:cfff:fe70:86ae
                     15                 3                   4

Last Cleared: 0h 30m 28s ago
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show running-config

`show running config`

### Description

Displays all running configurations for all protocols including RIPng.

### Examples

Displaying all running configurations for all protocols including RIPng:

```
switch# show running-config
Current configuration:
!
!Version Halon 0.1.0 (Build: genericx86-64-Halon-0.1.0-master-20170309054955-dev)
!Schema version 0.1.8
lldp enable
timezone set utc
vrf green
vrf red
led base-loc_fdc on
led base-loc on
led base-hlth_fdc fast_blink
led base-pwr_fdc on
!
!
!
!
!
!
aaa authentication login default local
aaa authorization commands default none
!
!
!
!
router ospfv3 1
router ripng 1
    maximum-paths 5
    distance 1
    redistribute ospfv3 1
    timers update 40 timeout 200 garbage-collection 150
router ripng 1 vrf red
    default-information originate always
    maximum-paths 7
    distance 5
vlan 1
    no shutdown
interface lag 44
    no shutdown
    ipv6 address link-local
    ipv6 ripng 1
        send disable
interface 1
    no shutdown
    ipv6 address link-local
    ipv6 ripng 1
        receive disable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

# Chapter 136

# Route policy and route map commands

This section describes general and filtering commands, as well as match, set and show commands for configuring route policies and route maps.

## General or filtering commands

### ip aspath-list

```
ip aspath-list <ASPATH-LIST-NAME> [seq <SEQ>] {permit | deny} <REGEXP>
no ip aspath-list <ASPATH-LIST-NAME> [seq <SEQ>] {permit | deny} <REGEXP>
```

#### Description

Configures an AS Path list to match a specific AS path. AS Path lists are named lists of regular expression rules. They are used to match AS Path attributes in the routes for inclusion in or exclusion from route policies. The sequence number is optional and is autogenerated whenever it is not explicitly mentioned. All AS Path list rules with the same name are grouped together.

The **no** form of this command removes the AS Path list configuration.

| Parameter | Description |
|---|---|
| `<ASPATH-LIST-NAME>` | Specifies the name of the AS Path list. |
| `seq <SEQ>` | Specifies the order of reference of the regular expression rules. |
| `{permit \| deny}` | Specifies whether the route is available for further processing when there is a match. |
| `<REGEXP>` | Specifies the regular expression to match the AS Path. Standard regular expression wildcards are supported. The _ character can be used to match the AS Path boundary. |

#### Examples

Configuring an AS Path list with sequence numbering:

```
switch(config)# ip aspath-list ASLst seq 5 permit _4*
```

Configuring a prefix list without sequence numbering:

```
switch(config)# ip aspath-list ASLst permit _4*
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

#### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config | Administrators or local user group members with execution rights for this command. |

## ip community-list

```
ip community-list standard <COMM-LIST-NAME> <DESCRIPTION> [seq <SEQ>] {permit | deny}
<COMMUNITY-NUMBER>
no ip community-list standard <COMM-LIST-NAME> <DESCRIPTION> [seq <SEQ>] {permit | deny}
<COMMUNITY-NUMBER>
```

### Description

Configures a community list to match a specific community number attribute. Community-list is a named list of regular expressions. They are used to match the community number attributes in the routes for inclusion in, or exclusion from route policies. The sequence number is optional and is autogenerated whenever it is not explicitly mentioned. All community-list rules with the same name are grouped.

The **no** form of this command removes the community list configuration.

| Parameter | Description |
|---|---|
| *<COMM-LIST-NAME>* | Specifies the name of the community list that matches community number of a route. |
| *<DESCRIPTION>* | Specifies the description of the community list. Maximum character limit is 80. |
| seq *<SEQ>* | Specifies the order of reference of the regular expression rules. |
| {permit \| deny} | Specifies whether the route is available for further processing when there is a match. |
| *<COMMUNITY-NUMBER>* | Specifies the community number. The community number must be in AA: NN format or from the list of well-known community. |

### Examples

Configuring a community list with sequence numbering:

```
switch(config)# ip community-list standard CommLst seq 5 permit 101:41
```

Configuring a community list without sequence numbering:

```
switch(config)# ip community-list standard CommLst no-export permit
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## ip prefix-list

```
ip prefix-list <PREFIX-LIST-NAME> [seq <SEQ>] <IP-PREFIX/MASK> [ge <0-32>] [le <0-32>]
no ip prefix-list <PREFIX-LIST-NAME> [seq <SEQ>] <IP-PREFIX/MASK> [ge <0-32>] [le <0-32>]
```

### Description

Configures a prefix list to match a set of prefixes. Prefix lists are named lists of route prefixes. They are used to match routes for inclusion in or exclusion from route policies. The sequence number determines the order of matching. The matches are performed starting from the lowest sequence number to the highest sequence number until there is a match. The sequence number is however optional and is autogenerated whenever it is not explicitly mentioned. All prefixes with the same prefix list name are grouped.

The autogenerated sequence number is derived by adding 10 to the highest sequence number available. This technique makes it possible to insert new prefix list sequence number in between.

The **ge** and **le** parameters are used to combine prefixes with a range of network mask. For example, **172.131.0.0/16 ge 16 le 24** will match all prefixes within the 172.131.0.0/16 network that have a mask greater than or equal to 16 bits and less than or equal to 24 bits in length. For instance, 172.131.1.0/18 would match, because its length is between 16 and 24 but 172.0.0.0/8 or 172.131.1.128/25 would not match.

The **no** form of this command removes the prefix list configuration. Prefix-list commands which generate sequence numbers must explicity use sequence numbers in the **no** form.

| Parameter | Description |
|---|---|
| *<PREFIX-LIST-NAME>* | Specifies the name of the prefix list. |
| `seq` *<SEQ>* | Specifies the order of reference of the prefix rules. |
| `{permit | deny}` | Specifies whether the route is available for further processing when there is a match. |
| *IP-PREFIX/MASK>* | Specifies the IP prefix or mask. |
| `ge` *<0-32>* | Specifies the minimum prefix length to be matched. |
| `le` *<0-32>* | Specifies the maximum prefix length to be matched. |

### Examples

Configuring a prefix list with sequence numbering:

```
switch(config)# ip prefix-list PFXLST seq 5 permit 4.0.0.0/8 ge 9 le 12
```

Configuring a prefix list without sequence numbering:

```
switch(config)# ip prefix-list PSXLST permit 5.0.0.0/8
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config | Administrators or local user group members with execution rights for this command. |

## ipv6 prefix-list

```
ipv6 prefix-list <PREFIX-LIST-NAME> [seq <SEQ>] <IPV6-PREFIX/MASK> [ge <0-128>] [le <0-128>]
no ipv6 prefix-list <PREFIX-LIST-NAME> [seq <SEQ>] {ip | ipv6} <IPV6-PREFIX/MASK> [ge <0-128>] [le <0-128>]
```

### Description

Configures a prefix list to match a set of prefixes. Prefix lists are named lists of route prefixes. They are used to match routes for inclusion in or exclusion from route policies. The sequence number determines the order of matching. The matches are performed starting from the lowest sequence number to the highest sequence number until there is a match. The sequence number is however optional and is autogenerated whenever it is not explicitly mentioned. All prefixes with the same prefix list name are grouped.

The autogenerated sequence number is derived by adding 10 to the highest sequence number available. This technique makes it possible to insert new prefix list sequence number in between.

The **ge** and **le** parameters are used to combine prefixes with a range of network mask. For example, **2000::/64 ge 65 le 70** will match all prefixes within the 2000::/64 network that have a mask greater than or equal to 65 bits and less than or equal to 70 bits in length.

The **no** form of this command removes the prefix list configuration. Prefix-list commands which generate sequence numbers must explicity use sequence numbers in the **no** form.

| Parameter | Description |
|---|---|
| *<PREFIX-LIST-NAME>* | Specifies the name of the prefix list. |
| seq *<SEQ>* | Specifies the order of reference of the prefix rules. |
| {permit \| deny} | Specifies whether the route is available for further processing when there is a match. |
| *IP-PREFIX/MASK>* | Specifies the IP prefix or mask. |
| ge *<0-128>* | Specifies the minimum prefix length to be matched. |
| le *<0-128>* | Specifies the maximum prefix length to be matched. |

### Examples

Configuring a prefix list with sequence numbering:

```
switch(config)# ipv6 prefix-list PFXLST seq 10 permit 2000::64 ge 65 le 70
```

Configuring a prefix list without sequence numbering:

```
switch(config)# ipv6 prefix-list PSXLST permit 2000::1/128
```

Removing the configuring of a prefix list:

```
switch(config)# no ipv6 prefix-list P2 seq 10 permit any
```

Removing the configuring of a prefix list:

```
switch(config)# no ipv6 prefix-list P1 seq 10
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config | Administrators or local user group members with execution rights for this command. |

## route-map

```
route-map <NAME> {permit | deny} seq <NUMBER>
no route-map <NAME> {permit | deny} seq <NUMBER>
```

### Description

Configures a route map entry with the given name and action by taking the CLI in the route map context. All route map entries with the same name belong to the same route map. The route map entry rules are processed in order by sequence number, until a match is found.

The **no** form of this command removes the route map entry configuration.

| Parameter | Description |
|---|---|
| `<NAME>` | Specifies the name of the route map. Required. |
| `{permit \| deny}` | Specifies whether the route is available for further processing when there is a match. Required. |
| `<NUMBER>` | Specifies the sequence number of the entry. Required. |

### Examples

Configuring a route map entry:

```
switch(config)# route-map GlobalMap permit seq 10
```

Removing a route map entry configuration:

```
switch(config)# no route-map GlobalMap permit seq 10
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## continue

```
continue <SEQUENCE NUMBER>
no continue
```

### Description

Allows you to execute additional entries in a route map. The sequence number specifies the route-map entry's sequence number that will be executed next if the existing entry's match clause is successful.

If a successful match occurs and continue command exists, the route map saves the set value first and then jumps to the specified route map entry.

Set clauses are saved during the match clause evaluation and are executed only after the route map evaluation is completed. The set clauses are executed in the order in which they were configured.

Set clauses can be accumulative or additive as **set as-path prepend** or it can be absolute as **set metric**. For set commands that configures an accumulative value, subsequent values are added in order in which they were configured. For set commands that configures an absolute value, The values from the last instance will be applied.

The **no** form of this command removes the route map continue configuration.

If the specified route-map sequence entry does not exist, route-map processing will be terminated at the current sequence number if its clause is matched. The continue sequence number must be higher than the current route map sequence number for this command to take effect.

| Parameter | Description |
|---|---|
| *<SEQUENCE NUMBER>* | Specifies the value of the route map entry to be executed next after a successful match clause. |

## Examples

Configuring a route map to continue to execute an additional entry:

```
switch(config)# route-map GlobalMap permit 10
switch(config-route-map-GlobalMap-10)# continue 40
```

Removing a route map continue configuration:

```
switch(config)# route-map GlobalMap permit seq 10
switch(config-route-map-GlobalMap-10)# no continue 40
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# Match commands

## match aspath-list

```
match aspath-list <ASPATH-LIST-NAME>
no match aspath-list <ASPATH-LIST-NAME>
```

### Description

Matches the AS path attribute of the route with one or more regular expressions in the AS path list.

The **no** form of this command restores the default behavior of not matching the AS path attribute of the route.

| Parameter | Description |
|---|---|
| *<ASPATH-LIST-NAME>* | Specifies the name of the AS path list to match the AS path attribute of the route. |

### Example

Configuring a match clause in the route map to match the AS path list:

```
switch(config)# ip aspath-list ASLst permit 1001
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match aspath-list ASLst
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match community-list

```
match community-list <COMMUNITY-LIST-NAME> [exact-match]
no match community-list <COMMUNITY-LIST-NAME> [exact-match]
```

### Description

Matches the community number attribute of the route with one, or more regular expressions in the community-list.

The **no** form of this command restores the default behavior of not matching the community number attribute of the route.

| Parameter | Description |
|---|---|
| *<COMMUNITY-LIST-NAME>* | Specifies the name of the community-list to match the community number attribute of the route. |
| [exact-match] | Indicates that the community number attribute must match exactly with the expressions in the community-list. However, the order of the communities in the community-list is of no significance. |

### Example

Configuring a match clause in the route map to match the community list:

```
switch(config)# ip community-list standard CommLst 101:41 permit 12:201
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match community-list CommLst
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config-route-map | Administrators or local user group members with execution rights for this command. |

## match interface

```
match interface <INTERFACE-NAME>
no match interface <INTERFACE-NAME>
```

### Description

Matches the outgoing interface value of the route with the value configured in the match clause. This command is applicable to static and connected routes which will be redistributed to the BGP protocol.

The **no** form of this command restores the default behavior of not matching the outgoing interface value of the route.

| Parameter | Description |
|---|---|
| *<INTERFACE-NAME>* | Specifies the value to be matched with the outgoing interface of the route entry. |

### Example

Configuring a match clause in the route map to match the outgoing interface of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match interface  1/1/1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match ip address prefix-list

```
match ip address prefix-list <PREFIX-LIST-NAME>
no match ip address prefix-list <PREFIX-LIST-NAME>
```

### Description

Matches the destination IP address prefix of the routes with one or more addresses in the prefix list.

The **no** form of this command restores the default behavior of not matching the destination IP address prefix of the routes to their default value. This command is applicable to OSPF, static, and connected routes which will be redistributed to the BGP protocol.

| Parameter | Description |
|---|---|
| *<PREFIX-LIST-NAME>* | Specifies the name of the prefix list to be matched with the network address of the route. |

### Example

Configuring a prefix list and a match clause in route map to match the prefix list:

```
switch(config)# ip prefix-list PfxLst permit 4.0.0.0/8
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match ip address prefix-list PfxLst
```

When the IP prefix list with prefix and mask-length of *0.0.0.0/0* is used, the route matches default-route *0.0.0.0/0* as well as any other route. This behavior would be changed to match only the default-route in the next release.

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match ip next-hop

```
match {ip | ipv6} next-hop {<ADDRESS> | prefix-list <PREFIX-LIST-NAME>}
no match {ip | ipv6} next-hop [<ADDRESS> | prefix-list <PREFIX-LIST-NAME>]
```

### Description

Matches the next-hop address of the route with the configured address in the match clause. This command is applicable to static routes which will be redistributed to BGP protocol.

The **no** form of this command restores the default behavior of not matching the next-hop address of the route.

| Parameter | Description |
|---|---|
| *<ADDRESS>* | Specifies the IPv4 address to match with the next-hop address of the route. |
| `prefix-list` *<PREFIX-LIST-NAME>* | Specifies the name of the IP prefix list to be matched with the next-hop address of the route. |

### Example

Configuring a match clause in the route map to match the next-hop address of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match ip next-hop 1.1.1.2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match ip route-source

```
match ip route-source prefix-list <PREFIX-LIST-NAME>
no match ip route-source prefix-list <PREFIX-LIST-NAME>
```

### Description

Matches the IP address of the source of the route using IP prefix lists.

The **no** form of this command restores the default behavior of not matching the IP address of the route.

| Parameter | Description |
|---|---|
| *<PREFIX-LIST-NAME>* | Specifies the name of the prefix list to match the IP address of the source of the route. |

### Example

Configuring a match clause in the route map to match the source of the route:

```
switch(config)# ip prefix-list RouterLst 4.4.4.4/32
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match ip route-source prefix-list RouterLst
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match local-preference

```
match local-preference <VALUE>
no match local-preference <VALUE>
```

### Description

Matches the local preference value of the route with the value configured in the match clause.

The **no** form of this command restores the default behavior of not matching the local preference value of the route.

| Parameter | Description |
|---|---|
| *<VALUE>* | Specifies the value to be matched with the route entry local preference in the range of 1 to 4294967295. |

### Example

Configuring a match clause in the route map to match the local preference of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match local-preference 100
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config-route-map | Administrators or local user group members with execution rights for this command. |

## match metric

```
match metric <VALUE>
no match metric <VALUE>
```

### Description

Matches the MED value of the route with the value configured in the match clause.

The **no** form of this command restores the default behavior of not matching the MED value of the route.

| Parameter | Description |
|---|---|
| *<VALUE>* | Specifies the value to be matched with the route entry MED. |

### Example

Configuring a match clause in the route map to match the metric of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match metric 10
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match origin

```
match origin {igp | egp | incomplete}
no match origin [igp | egp | incomplete]
```

### Description

Matches the route origin attribute of the route with route configured in the match clause.

The **no** form of this command restores the default behavior of not matching the route origin attribute of the route.

| Parameter | Description |
|---|---|
| `{igp \| egp \| incomplete}` | Specifies if the route origin attribute is matched with a match clause which originated as IGP, EGP, or has unknown origin. The unknown origin is typically redistributed from another routing protocol. |

### Example

Configuring a match clause in the route map to match the origin:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match origin igp
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match route-type

```
match route-type {external <type-1|type-2> | <evpn-type-2|evpn-type-3|evpn-type-5>}
no match route-type {external <type-1|type-2> | <evpn-type-2|evpn-type-3|evpn-type-5>}
```

### Description

This command matches the OSPF external route or EVPN route-type against the value configured in the match clause. Furthermore, the **type-1** and **type-2** metric can be matched for OSPF external route.

The **no** form of this command restores the default behavior of not matching the metric-type value of the OSPF external route.

| Parameter | Description |
|---|---|
| `{type-1 \| type-2}` | Specifies the *type-1* or *type-2* OSPF value to be matched with the external route. |
| `evpn-type-2` | Match MAC/IP advertisement routes |
| `evpn-type-3` | Match inclusive multicast ethernet tag routes |
| `evpn-type-5` | Match IP prefix routes |

### Example

Configuring a match clause in the route map to match the metric-type value of the OSPF external route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match route-type external type-1
```

Configure a match clause in route-map to match EVPN route-type's.

```
switch(config)# route-map GlobalMap permit 11
switch(config-route-map)# match route-type evpn-type-2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Additional EVPN type parameters are introduced. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match source-protocol

```
match source-protocol {bgp | connected | ospf | static}
no match source-protocol [bgp | connected | ospf | static]
```

### Description

Matches the source routing protocol value of the route with the value configured in the match clause.

The **no** form of this command restores the default behavior of not matching the source routing protocol value of the route.

| Parameter | Description |
|---|---|
| `{bgp | connected | ospf | static}` | Specifies the *bgp*, *connected*, *ospf*, or *static* value to be matched with the route entry source protocol. |

### Example

Configuring a match clause in the route map to match the source protocol route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# match source-protocol ospf
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match tag

```
match tag <value>
no match tag <value>
```

### Description

Matches the tag value of the route with the one configured in the match clause. Applies to static routes that will be redistributed to BGP, OSPFv3 and OSPFv3 protocols.

The **no** form of this command removes the tag value of the route.

| Parameter | Description |
|---|---|
| `value` | Numeric value to match with the route tag. Required. |

### Example

Configuring a match clause in route-map to match the tag value of the route:

```
switch(config)# route-map GlobalMap permit 11
switch(config-route-map)# match tag 20
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## match vni

```
match vni <value>
no match vni <value>
```

### Description

Matches the VNI value of the route with the one configured in the `match` clause. Applies to matching L2VNIs or L3VNIs. Use the `continue` clause if both L2VNI and L3VNI are to be matched. Route maps with the `match vni` clause can be used with L2VPN EVPN neighbors only.

The **no** form of this command removes the match for the VNI value of the route.

| Parameter | Description |
|---|---|
| *<value>* | Numeric value to match with the route tag. Required.<br>Range: 1 to 16777214 |

### Example

Configuring a match clause in route map to match the VNI value of the route:

```
switch(config)# route-map GlobalMap permit 11
switch(config-route-map)# match vni 10000
```

Configuring a match clause in route map to match both L2VNI and L3VNI in a single route map:

```
switch(config)# route-map GlobalMap permit 11
switch(config-route-map)# match vni 10000
switch(config-route-map)# continue 12
switch(config)# route-map GlobalMap permit 12
switch(config-route-map)# match vni 10
```

The following example is different from the one above, as it configures a match clause in route map to match any one of the two VNIs:

```
switch(config)# route-map GlobalMap permit 10
switch(config-route-map)# match vni 10000
switch(config)# route-map GlobalMap permit 20
switch(config-route-map)# match vni 10
switch(config)# route-map GlobalMap deny 30
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

# Set commands

## set as-path exclude

```
set as-path exclude <AS>
no set as-path exclude <AS>
```

### Description

Removes all occurrences of the configured AS Path from the AS Path attribute of the route.

The **no** form of this command restores the default behavior of not modifying the AS Path attribute list.

| Parameter | Description |
|---|---|
| *<AS>* | Specifies the AS number to be removed from the AS Path attribute of the route. |

## Example

Configuring a set clause in the route map to remove the AS from the AS Path attribute of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# set as-path exclude 1001
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

# set as-path prepend

```
set as-path prepend <AS> <AS>...
no set as-path prepend <AS> <AS>...
```

## Description

Pretends the list of the configured AS numbers to the AS Path attribute of the routes. To ensure that the AS path conforms to standards, the local AS is prepended after this command is executed.

The **no** form of this command restores the default behavior of not modifying the AS Path attribute list.

| Parameter | Description |
|---|---|
| *<AS> <AS>...* | Specifies the AS numbers to be prepended from the AS Path attribute of the route. |

## Example

Configuring a set clause in the route map to prepend the AS from the AS Path attribute of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# set as-path prepend 1
switch(config-route-map-GlobalMap-11)# no set as-path prepend 102
```

The **no** form of the command deletes the entire list of AS-Path prepend configuration regardless of the parameter list. In this example, the **no** form command would result in deletion of all the three AS numbers that were earlier configured.

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set community

```
set community {<AA:NN> | internet | no-export | no-advertise | local-as} [additive |
delete]
no set community [<AA:NN> | internet | no-export | no-advertise | local-as] [additive |
delete]
```

### Description

Modifies the community number attribute of the route with the value configured in the set clause. This command is applicable to OSPF, static, and connected routes which will be redistributed to the BGP protocol.

The **no** form of this command restores the default behavior of not modifying the community number attribute of the route.

| Parameter | Description |
|---|---|
| `{<AA:NN> | internet | no-export | no-advertise | local-as}` | Selects the value to be set as the community number attribute of the route in the **AA:NN** format (quotation marks required when multiple communities are listed, for example: **set community "65001:100 65001:200"**) or as a known community name **internet**, **no-export**, **no-advertise**, and **local-as**. |
| `[additive]` | Specifies that the specified community number is added to the existing community number attribute of the route. |
| `[delete]` | Specifies that the specified community number is removed from the existing community number attribute of the route. |

### Example

Configuring a set clause in the route map to modify the community number attribute of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# no set community 11:101
switch(config-route-map-GlobalMap-11)# set community no-advertise
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set dampening

```
set dampening {half-life <VALUE> reuse <VALUE> suppress <VALUE> max-suppress-time
<VALUE>}
no set dampening
```

### Description

Sets parameters of route flap dampening feature.

| Parameter | Description |
|---|---|
| `half-life` | Time to reduce the penalty to half. |
| `reuse` | Lower threshold of penalty. |
| `suppress` | Upper threshold of penalty. |
| `max-suppress-time` | Max time to keep route suppressed. |

### Example

```
switch(config-route-map-abc-20)# set dampening half-life 5 reuse 50 suppress 125
max-suppress-time 255

switch(config-route-map-abc-20)# no set dampening half-life 5 reuse 50 suppress
125 max-suppress-time 255

switch(config-route-map-abc-20)# set dampening

switch(config-route-map-abc-20)# no set dampening
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set ip nexthop

```
set {ip | ipv6} nexthop {global} <IP-ADDR>
no set {ip | ipv6} nexthop {global} <IP-ADDR>
```

### Description

Sets the IP address of the next-hop of the route with the value configured in the set clause.

The **no** form of this command restores the default behavior of not modifying the IP address of the next-hop of the route.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* | Specifies the IPv4 address to be set as the next-hop address of the route. |

### Example

Configuring a set clause in the route map to modify the next-hop address of the route entry:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# set ip nexthop 1.1.1.2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set ipv6 nexthop global

```
set ipv6 nexthop global <IP-ADDRESS>
no set ip nexthop global <IP-ADDRESS>
```

### Description

Sets the IPv6 address of the nexthop of the routes with the IPv6 address configured in the set clause.

The **no** form of this command removes this configuration.

| Parameter | Description |
|---|---|
| *<IP-ADDRESS>* | Specifies the IPv6 address of the nexthop router. |

### Examples

Configuring a set clause in route-map to modify the nexthop address of route entry:

```
switch(config)# route-map GlobalMap premit 11
switch(config-route-map)# set ipv6 nexthop global 1.1.1.2
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## set local-preference

```
set local-preference <VALUE>
no set local-preference <VALUE>
```

### Description

Modifies the local-preference attribute of the route entry with the value configured in the set clause.

The **no** form of this command restores the default behavior of not modifying the local-preference attribute of the route entry.

| Parameter | Description |
|---|---|
| *<VALUE>* | Specifies the value to be set as the local-preference attribute of the route entry. Range: 0 to 4294967295. |

### Example

Configuring a set clause in the route map to modify the metric value of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# set local-preference 100
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set metric

```
set metric <VALUE>
no set metric <VALUE>
```

### Description

Modifies the metric value of the route with the value configured in the set clause. This command is applicable to OSPF, static, and connected routes which will be redistributed to the BGP protocol.

The **no** form of this command restores the default behavior of not modifying the metric value of the route.

| Parameter | Description |
|---|---|
| *<VALUE>* | Specifies the value to be set as the metric value of the route. Range: 0 to 4294967295. |

### Example

Configuring a set clause in the route map to modify the metric value of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# set metric 10
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set origin

```
set origin [igp | egp | incomplete]
no set origin [igp | egp | incomplete]
```

### Description

Modifies the route origin attribute of the route update with the value configured in the set clause.

The **no** form of this command restores the default behavior of not modifying the route origin attribute of the route.

| Parameter | Description |
|---|---|
| `{igp | egp | incomplete}` | Selects the route update originated to IGP, EGP, or incomplete. When incomplete is selected, the route update origin is set to unknown. |

### Example

Configuring a set clause in the route map to modify the origin attribute of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap-11)# set origin igp
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set tag

```
set tag <value>
[no] set tag <value>
```

### Description

Modifies the tag value of the route with the one configured in the set clause. Applicable to static routes that will be redistributed to ospfv2 and ospfv3 protocols.

The **no** form of this command removes the set clause tag value.

| Parameter | Description |
|---|---|
| `value` | Numeric value to change the route entry tag. Range: 0-4294967295. Required. |

### Example

Configuring a set clause in route-map to modify the tag value of the route:

```
switch(config)# route-map GlobalMap permit 11
switch(config-route-map)# set tag 10
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-route-map` | Administrators or local user group members with execution rights for this command. |

## set weight

```
set weight <VALUE>
no set weight <VALUE>
```

### Description

Modifies the weight attribute of the route with the value configured in the set clause.

The **no** form of this command restores the default behavior of not modifying the weight attribute of the route.

| Parameter | Description |
|---|---|
| *<VALUE>* | Specifies the value to be set as the weight attribute of the route. Range: 0 to 65535. |

### Example

Configuring a set clause in the route map to modify the metric value of the route:

```
switch(config)# route-map GlobalMap permit seq 11
switch(config-route-map-GlobalMap=11)# set weight 100
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config-route-map | Administrators or local user group members with execution rights for this command. |

# Show commands

## show ip aspath-list

```
show ip aspath-list [<NAME>] [vsx-peer]
```

### Description

Shows the configuration details of the AS path list.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies name of the AS path list. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Showing the IP AS path list configuration information:

```
switch# show ip aspath-list
ip aspath-list ASLst
    seq 10 permit 22 33
    seq 20 deny 44
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show ip community-list

`show ip community-list [<NAME>] [vsx-peer]`

### Description

Shows the configuration details of the community-list.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies name of the community-list. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Showing the community list configuration information:

```
switch# show ip community-list
ip community-list standard CommLst
    seq 10 permit 11:101
    seq 20 deny 12:201
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show ip prefix-list

```
show ip prefix-list [<NAME>] [vsx-peer]
```

### Description

Shows the configuration details of the IP prefix lists.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies name of the IP prefix lists. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Showing the IP prefix list configuration information:

```
switch# show ip prefix-list
ip prefix-list PfxLst: 2 entries
   seq 10 permit 3.0.0.0/8 ge 8 le 8
   seq 20 deny 4.0.0.0/8 ge 8 le 8
```

```
switch# show ipv6 prefix-list
ipv6 prefix-list x: 1 entries
                       seq     10 permit 2011::/64ge 64le 64
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show route-map

```
show route-map [<NAME>] [vsx-peer]
```

## Description

Shows the configuration details of the route map.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies name of the route map. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

Showing the route map configuration information:

```
switch# show route-map
Route map: InternetFilter
   Seq 10, permit,
     Match :
       origin : egp
       metric : 123
     Set :
       community : 23:34
       metric : 3
       as_path_exclude : 123
       local_preference : 3456
       origin : igp
       weight : 25
   Seq 20, permit,
     Match :
       origin : egp
       metric : 456
     Set :
       community : 44:44
       metric : 5
       as_path_prepend : 444
       local_preference : 66
       origin : igp
       weight : 250

Route map: LocalFilter
   Seq 10, permit,
       origin : egp
       metric : 10
                                                       ip next-hop address         : 2.2.2.3
       local-preference            : 20
       route-type                  : external_type1
       source-protocol             : static
       prefix-list                 : PfxLst
       aspath-list                 : ASLst
       community-list              : CommLst
       ip next-hop prefix-list     : PfxLst
       ip route-source prefix-list : PfxLst
     Set :
       community : 22:33
       metric : 25
       as_path prepend : 65535 65534
                                                       ip next-hop address : 2.2.2.4
       local_preference : 30
       origin : igp
       weight : 30
       dampening                   : half-life = 5, reuse = 50, suppress = 125,
max-suppress-time = 15
```

All the match clauses are grouped. All the set clauses are grouped.

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# Chapter 137
# RPVST+ commands

## clear spanning-tree statistics

```
clear spanning-tree statistics [VLAN-ID]
```

### Description

Clears the spanning tree BPDU statistics, either all statistics or those related to a specified VLAN.

| Parameter | Description |
|---|---|
| `VLAN-ID` | Specifies the VLAN ID. |

### Example

Clearing all spanning tree BPDU statistics:

```
switch(config)# clear spanning-tree statistics
```

Clearing spanning tree BPDU statistics for a particular VLAN :

```
switch(config)# clear spanning-tree statistics 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show capacities rpvst

```
show capacities rpvst
```

### Description

Shows the capacities of RPVST VLANs configurable on a system and RPVST VPORTs supported in a system.

### Examples

Showing capacities on a 6400 switch:

```
switch# show capacities rpvst
System Capacities : Filter RPVST
Capacities Name                                                   Value
--------------------------------------------------------------------------
Maximum number of RPVST VLANs configurable on the system           768
Maximum number of RPVST VPORTs supported in a system              2048
```

Showing capacities on a 6300 switch:

```
switch# show capacities rpvst
System Capacities : Filter RPVST
Capacities Name                                                   Value
--------------------------------------------------------------------------
Maximum number of RPVST VLANs configurable on the system           512
Maximum number of RPVST VPORTs supported in a system              2048
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Increased RPVST VLAN capacity to 768 on 6400 switch series. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show capacities-status rpvst

```
show capacities-status rpvst
```

### Description

Shows the number of RPVST VLANs and RPVST VPORTs currently configured.

### Examples

Showing capacities-status on a 6400 switch:

```
switch# show capacities rpvst
System Capacities Status : Filter RPVST
Capacities Status Name                Value            Maximum
--------------------------------------------------------------------------
Number of RPVST VLANs configured          5                768
Number of RPVST VPORTs configured         9               2048
```

Showing capacities-status on a 6300 switch:

```
switch# show capacities-status rpvst
System Capacities Status : Filter RPVST
Capacities Status Name                Value             Maximum
--------------------------------------------------------------------------
Number of RPVST VLANs configured          3                 254
Number of RPVST VPORTs configured         9                2048
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.09 | Increased RPVST VLAN capacity to 768 on 6400 switch series. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show spanning-tree

```
show spanning-tree [vsx-peer]
```

## Description

Shows the spanning tree mode and information on the RPVST instances.

When Port security is enabled on the port and the client is not-yet authenticated, the security feature keeps the port in the **Down** state. STP also keeps the port in the **Blocking** state and the role as **Disabled** in the **show spanning-tree** command output, whereas in the hardware, the state is maintained as **Learning**. After client authentication is successful, the port state changes to **Forwarding**.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing spanning tree mode and RPVST instance information:

```
switch# show spanning-tree
Spanning tree status             : Enabled Protocol: RPVST
Extended System-id               : Enabled
Ignore PVID Inconsistency        : Enabled
Path cost method                 : Long
RPVST-MSTP Interconnect VLAN     : 1
Current Virtual Ports Count      : 7
Maximum Allowed Virtual Ports    : 2048

VLAN1
  Root ID    Priority   : 32768
             MAC-Address: 70:72:cf:31:c9:23
             This bridge is the root
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

  Bridge ID  Priority  : 32768
             MAC-Address: 70:72:cf:31:c9:23
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

PORT     ROLE        STATE      COST    PRIORITY  TYPE      BPDU-Tx   BPDU-Rx   TCN-Tx    TCN-Rx
-------- ----------- ---------- ------- --------- --------- --------- --------- --------- -------
1/1/1    Designated  Forwarding 20000   128       P2P Edge  100       60        20        10
1/1/2    Designated  Forwarding 20000   128       P2P       100       60        20        10
1/1/3    Designated  Forwarding 20000   128       Shr       100       60        20        10
1/1/4    Designated  Forwarding 20000   128       Shr Edge  100       60        20        10
1/1/5    Alternate   Loop-Inc   20000   128       Shr Edge  100       60        20        10
1/1/6    Alternate   Root-Inc   20000   128       Shr Edge  100       60        20        10
1/1/7    Disabled    Down       20000   128       P2P       100       60        20        10

Number of topology changes    : 4
Last topology change occurred : 516 seconds ago
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.09 | A new state `Down` is added in the output. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show spanning-tree detail

`show spanning-tree detail [vsx-peer]`

### Description

Shows the detailed spanning tree mode and information on the RPVST instances.

When Port security is enabled on the port and the client is not-yet authenticated, the security feature keeps the port in the **Down** state. STP also keeps the port in the **Blocking** state and the role as **Disabled** in the **show spanning-tree** command output, whereas in the hardware, the state is maintained as **Learning**. After client authentication is successful, the port state changes to **Forwarding**.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Showing spanning tree mode and detailed RPVST instance information:

```
switch# show spanning-tree detail
Spanning tree status           : Enabled Protocol: RPVST AUTO
Extended System-id             : Enabled
Ignore PVID Inconsistency      : Disabled
Path cost method               : Long
RPVST-MSTP Interconnect VLAN   : 1
Current Virtual Ports Count    : 2032
Maximum Allowed Virtual Ports  : 2048
Maximum Allowed RPVST Instances: 254
Configured RPVST Enable Vlans  : 20-30,100
Configured RPVST Disable Vlans : 1-10
Auto RPVST Enable Vlans        : 11-19,31-99,101-264
Vlans with no RPVST Instance due to Max limit reach : 265-300

VLAN1
  Root ID    Priority   : 32768
             MAC-Address: 70:72:cf:31:c9:23
             This bridge is the root
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

  Bridge ID  Priority  : 32768
             MAC-Address: 70:72:cf:31:c9:23
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

PORT     ROLE        STATE      COST    PRIORITY  TYPE      BPDU-Tx   BPDU-Rx   TCN-Tx    TCN-Rx
-------- ----------- ---------- ------- --------- --------- --------- --------- --------- -------
1/1/1    Designated  Forwarding 20000   128       P2P Edge  100       60        20        10
1/1/2    Designated  Forwarding 20000   128       P2P       100       60        20        10
1/1/3    Designated  Forwarding 20000   128       Shr       100       60        20        10
1/1/4    Designated  Forwarding 20000   128       Shr Edge  100       60        20        10
1/1/5    Alternate   Loop-Inc   20000   128       Shr Edge  100       60        20        10
1/1/6    Alternate   Root-Inc   20000   128       Shr Edge  100       60        20        10
1/1/7    Disabled    Down       20000   128       P2P       100       60        20        10
lag1     Disabled    Down       20000   128       P2P Bound 100       60        20        10

Topology change flag : False
Number of topology changes : 1
Last topology change occurred : 33293 seconds ago

Port 1/1/1
Designated Root Priority                  : 32768          Address: 48:0F:CF:AF:22:1D
Designated Bridge Priority                : 32768          Address: 48:0F:CF:AF:22:1D
Designated Port                           : 1/1/1
Forwarding-State transitions              : 0
BPDUs sent 1582, received 1506
TCN_Tx: 10, TCN_Rx: 10

Port lag1
Designated Root Priority                  : 32768          Address: 48:0F:CF:AF:22:1D
Designated Bridge Priority                : 32768          Address: 48:0F:CF:AF:22:1D
Designated Port                           : lag1
Forwarding-State transitions              : 0
BPDUs sent 1402, received 1316
TCN_Tx: 10, TCN_Rx: 10
Multi-chassis role                        : active
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | A new state **Down** is added in the output. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show spanning-tree inconsistent-ports

```
show spanning-tree inconsistent-ports [vlan <VLAN-ID>]
```

## Description

Shows ports blocked by STP protection functions such as Root guard, Loop guard, BPDU guard, and RPVST guard.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies a VLAN ID number. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing inconsistent port information:

```
switch# show spanning-tree inconsistent-ports
VLAN ID      Blocked Port   Reason
------------ -------------- ------------
1            1/1/1          BPDU Guard
2            1/1/1          BPDU Guard
3            1/1/1          BPDU Guard
4            1/1/1          BPDU Guard
5            1/1/1          BPDU Guard
6            1/1/1          BPDU Guard
7            1/1/1          BPDU Guard
8            1/1/1          BPDU Guard
9            1/1/1          BPDU Guard
10           1/1/1          BPDU Guard
```

Showing inconsistent port information for VLANs 1 to 4:

```
switch# show spanning-tree inconsistent-ports vlan 1-4
VLAN ID      Blocked Port   Reason
------------ -------------- ------------
1            1/1/3          Root Guard
2            1/1/7          BPDU Guard
3            1/1/9          Loop Guard
4            1/1/37         RPVST Guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager | Operators or Administrators or local user group members with |

| Platforms | Command context | Authority |
|---|---|---|
|  | (#) | execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show spanning-tree summary port

```
show spanning-tree summary port
```

## Description

Shows a summary of port-related spanning-tree configuration and status.

## Example

*On the 6400 Switch Series, interface identification differs.*

Showing a summary of port-related spanning tree information:

```
switch# show spanning-tree summary port

STP status                     : Enabled
Protocol                       : RPVST
BPDU guard timeout value       : None
BPDU guard enabled interfaces  : 1/1/1
BPDU filter enabled interfaces : None
Root guard enabled interfaces  : 1/1/3
Loop guard enabled interfaces  : 1/1/2
TCN guard enabled interfaces   : 1/1/1-1/1/3

Interface count by state

VLAN                   Blocking Listening Learning Forwarding Down
---------------------- -------- --------- -------- ---------- ----
VLAN1                         0         0        0          1    0
VLAN2                         0         0        0          1    0
---------------------- -------- --------- -------- ---------- ----
Total = 2                     0         0        0          2    0
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.09 | A new state **Down** is added in the output. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show spanning-tree summary root

`show spanning-tree summary root`

### Description

Shows the summary of spanning tree root and configurations for all VLANs.

### Example

*On the 6400 Switch Series, interface identification differs.*

Showing summary of spanning tree configurations:

```
switch# show spanning-tree summary root

STP status            : Enabled
Protocol              : RPVST
System ID             : f8:60:f0:c9:70:40

Root bridge for VLANs : 1-10

                                         Root Hello Max Fwd
VLAN     Priority Root ID                cost  Time Age Dly    Root Port
-------- -------- ----------------- --------- ----- --- --- ------------
VLAN1       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN2       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN3       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN4       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN5       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN6       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN7       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN8       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN9       32768 f8:60:f0:c9:70:40         0     2  20  15            0
VLAN10      32768 f8:60:f0:c9:70:40         0     2  20  15            0
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show spanning-tree vlan

`show spanning-tree vlan <VLAN-ID> [vsx-peer]`

## Description

Displays the spanning tree mode and information on the RPVST instance of the specified VLAN.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies the number of a VLAN. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing spanning tree mode and RPVST instance information for VLAN 2:

```
switch# show spanning-tree vlan 2
VLAN2
Spanning tree status: Enabled Protocol: RPVST
  Root ID     Priority   : 32768
             MAC-Address: 70:72:cf:76:43:2a
             This bridge is the root
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

  Bridge ID  Priority  : 32768
             MAC-Address: 70:72:cf:76:43:2a
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

PORT     ROLE         STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ------------ ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
```

```
1/1/7    Disabled    Down       20000      128        P2P        100          60
  20         10

Number of topology changes    : 4
Last topology change occurred : 516 seconds ago
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | A new state **Down** is added in the output. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show spanning-tree vlan detail

```
show spanning-tree vlan <VLAN-ID> detail [vsx-peer]
```

### Description

Displays the spanning tree mode and information on the RPVST instance of the specified VLAN and optionally displays details on the RPVST instance for the VLAN.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies the number of a VLAN. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Showing spanning tree mode and detailed RPVST instance information for VLAN 2:

```
switch# show spanning-tree vlan 2 detail
VLAN2
Spanning tree status: Enabled Protocol: RPVST
```

```
  Root ID    Priority   : 32768
             MAC-Address: 70:72:cf:76:43:2a
             This bridge is the root
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

  Bridge ID  Priority  : 32768
             MAC-Address: 70:72:cf:76:43:2a
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

PORT     ROLE        STATE      COST       PRIORITY  TYPE      BPDU-Tx    BPDU-Rx
  TCN-Tx     TCN-Rx
-------- ----------- ---------- ---------- --------- --------- ---------- --------
-- ---------- ----------
1/1/1    Designated  Forwarding 20000      128       P2P Edge  100        60
  20         10
1/1/2    Designated  Forwarding 20000      128       P2P       100        60
  20         10
1/1/3    Designated  Forwarding 20000      128       Shr       100        60
  20         10
1/1/4    Designated  Forwarding 20000      128       Shr Edge  100        60
  20         10
1/1/5    Alternate   Loop-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/6    Alternate   Root-Inc   20000      128       Shr Edge  100        60
  20         10
1/1/7    Disabled    Down       20000      128       P2P       100        60
  20         10

Topology change flag : False
Number of topology changes : 1
Last topology change occurred : 33293 seconds ago

Port 1/1/1
Designated root has priority :32768 Address: 48:0f:cf:af:22:1d
Designated bridge has priority :32768 Address: 48:0f:cf:af:22:1d
Designated port :1
Number of transitions to forwarding state : 0
BPDUs sent 1582, received 1506
TCN_Tx: 10, TCN_Rx: 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.09 | A new state **Down** is added in the output. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# spanning-tree bpdu-guard timeout

```
spanning-tree bpdu-guard timeout <INTERVAL>
no spanning-tree bpdu-guard timeout [<INTERVAL>]
```

## Description

Enables and configures the auto re-enable timeout in seconds for all interfaces with BPDU guard enabled. When an interface is disabled after receiving an unauthorized BPDU it will automatically be re-enabled after the timeout expires. The default is for the interface to stay disabled until manually re-enabled.

The **no** form of the command disables BPDU guard timeout on the interface. This is the default.

| Parameter | Description |
|---|---|
| *<INTERVAL>* | Specifies the re-enable timeout in seconds. Range: 1 to 65535. |

## Example

*On the 6400 Switch Series, interface identification differs.*

Enabling the BPDU guard timeout on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree bpdu-guard timeout 10
```

Disabling BPDU guard timeout on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree bpdu-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## spanning-tree extend-system-id

```
spanning-tree extend-system-id {enable | disable}
no spanning-tree extend-system-id
```

### Description

Configures use of extended system ID. When enabled, the VLAN ID is included in spanning tree packets. When disabled, the VLAN ID is set to NULL in the spanning tree packets.

By default, extended system ID is enabled. If you disable extended system ID, the bridge identifier field in the spanning tree packet is filled with zeros.

The **no** form of this command disables extended system ID.

| Parameter | Description |
|---|---|
| `enable` | Specifies enabling use of extended system ID. |
| `disable` | Specifies disabling use of extended system ID. |

### Examples

Enabling extended system ID:

```
switch# config
switch(config)# spanning-tree extend-system-id enable
```

Disabling extended system ID:

```
switch# config
switch(config)# spanning-tree extend-system-id disable
switch(config)# no spanning-tree extend-system-id
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## spanning-tree ignore-pvid-inconsistency

```
spanning-tree ignore-pvid-inconsistency {enable | disable}
no spanning-tree ignore-pvid-inconsistency
```

### Description

Configures port behavior when per-VLAN ID inconsistencies are present. For example, when the ports on both ends of a point-to-point link are untagged members of different VLANs, enabling this option allows RPVST+ to process untagged RPVST+ packets belonging to the peer's untagged VLAN as if they were received on the current device's untagged VLAN. When this option is disabled, RPVST+ blocks the link, causing traffic on the mismatched VLANs to be dropped.

If this option is enabled on multiple switches connected by hubs, there could be more than two VLANs involved in PVID mismatches that will be ignored by RPVST+.

If port VLAN memberships is misconfigured on a switch in the network, then enabling this option prevents RPVST+ from detecting the problem, which may result in packet duplication in the network since RPVST+ would not converge correctly.

This command affects all ports on the switch belonging to VLANs on which RPVST+ is enabled.

By default ignore per-VLAN ID inconsistency is disabled.

The **no** form of this command sets the ignore per-VLAN ID inconsistencies to disabled.

| Parameter | Description |
|---|---|
| `enable` | Specifies ignore per-VLAN ID inconsistencies and allow RPVST to run on mismatched links. |
| `disable` | Disables the ignore per-VLAN ID inconsistencies functionality. |

### Examples

Enabling ignore per-VLAN ID inconsistencies:

```
switch# config
switch(config)# spanning-tree ignore-pvid-inconsistency enable
```

Disabling ignore per-VLAN ID inconsistencies:

```
switch# config
switch(config)# spanning-tree ignore-pvid-inconsistency disable
switch(config)# no spanning-tree ignore-pvid-inconsistency
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## spanning-tree link-type

```
spanning-tree link-type {point-to-point | shared}
no spanning-tree link-type
```

### Description

Configures the link type of a port.

The **no** form of this command sets the spanning tree link type to the default value of **point-to-point**.

| Parameter | Description |
|---|---|
| `point-to-point` | Sets the spanning tree link type as point-to-point. Use this for full-duplex ports that provide a point-to-point link to devices such as a switch, bridge, or end-node. Default. |
| `shared` | Sets the spanning tree link type as shared. Use this when the port is connected to a hub. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Setting spanning tree link type to shared:

```
switch(config)# interface 1/1/1
switch(config-if)# spanning-tree link-type shared
```

Setting spanning tree link type to point-to-point for a port:

```
switch(config)# interface 1/1/1
switch(config-if)# no spanning-tree link-type
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## spanning-tree mode

```
spanning-tree mode {mstp|rpvst [auto-vlan-enable [priority <NUMBER>]]}
no spanning-tree mode {mstp|rpvst [auto-vlan-enable [priority <NUMBER>]]}
```

### Description

Sets the spanning tree protocol (STP) mode to either MSTP mode (Multiple-instance Spanning Tree Protocol) or RPVST mode (Rapid Per VLAN Spanning Tree). Enabling the RPVST Auto VLAN feature will run RPVST on all VLANs currently configured on the switch. Default priority of 8 will be assigned to the VLANs being auto created.

The **no** form of this command sets the spanning tree mode to the default **mstp**.

Enabling auto-VLAN can lead to an undeterministic state if auto scaled beyond the max system limit mentioned in the capacity-status.

| Parameter | Description |
|---|---|
| `mstp` | Sets the STP mode to MSTP which applies spanning tree separately for each set of VLANs called an MSTI (multiple spanning tree instance). |
| `rpvst` | Sets the STP mode to RPVST. |
| `auto-vlan-enable` | Selects RPVST auto VLAN mode. |
| `priority <NUMBER>` | Specifies the priorites for all auto created RPVST instances. Configured as a multiple of 4096. Default: 8. |

### Examples

Enabling MSTP mode:

```
switch(config)# spanning-tree mode mstp
```

Disabling MSTP mode:

```
switch(config)# no spanning-tree mode mstp
```

Enabling RPVST mode:

```
switch(config)# spanning-tree mode rpvst
```

Disabling RPVST mode:

```
switch(config)# no spanning-tree mode rpvst
```

Enabling RPVST auto VLAN with a priority of 1:

```
switch(config)# spanning-tree mode rpvst auto-vlan-enable priority 1
```

Disabling RPVST auto VLAN with a priority of 1:

```
switch(config)# no spanning-tree mode rpvst auto-vlan-enable priority 1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12.1000 | Auto VLAN enable added. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## spanning-tree pathcost-type

```
spanning-tree pathcost-type {long | short}
no spanning-tree pathcost-type [long|short]
```

### Description

Configures the spanning tree path cost type. The long mode provides support for the wider range of link speeds required by high-speed interfaces. All switches in the network must use the same path cost type or errors can occur in the spanning tree.

The **no** form of this command sets the spanning tree path cost type to the default **long**.

| Parameter | Description |
|---|---|
| `long` | Specifies the spanning tree path cost type as a 32-bit value, allowing port cost values to be set in the range 1-200,000,000. Default. |
| `short` | Specifies the spanning tree path cost type as a 16-bit value, allowing port cost values to be set in the range 1-65535. |

### Examples

Setting spanning tree path cost type to short:

```
switch# config
switch(config)# spanning-tree pathcost-type short
```

Setting spanning tree path cost type to long:

```
switch# config
switch(config)# spanning-tree pathcost-type long
```

Setting spanning tree path cost to default of long:

```
switch# config
switch(config)# no spanning-tree pathcost-type
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## spanning-tree rpvst-mstp interconnect vlan

```
spanning-tree rpvst-mstp-interconnect-vlan <VLAN-ID>
no spanning-tree rpvst-mstp-interconnect-vlan [<VLAN-ID>]
```

### Description

Configures the VLAN that has to be used to interconnect RPVST and MSTP domains. VLAN 1 is used by default.

The **no** form of this command sets the VLAN configuration to the default of 1.

- It is required to create the interconnect VLAN and then configure RPVST spanning tree on it.
- The same interconnect VLAN must be kept on all the switches in the network.
- Adding or deleting the interconnect VLAN triggers a re-convergence in the network.
- Deleting a VLAN that is configured as the interconnect VLAN does not reset the value to the default.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies the number of a VLAN. |

### Examples

This example configures VLAN 10 to used to interconnect RPVST and MSTP domains.

```
switch#(config)# spanning-tree rpvst-mstp-interconnect-vlan 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## spanning-tree tcn-guard

```
spanning-tree tcn-guard
no spanning-tree tcn-guard
```

### Description

Disables propagation of topology change notifications (TCNs) to other STP ports. Use this when you do not want topology changes to be noticed by peer devices. By default, the propagation is enabled.

The **no** form of this command, enables propagation of topology changes which is the default.

### Examples

Enabling `tcn-guard`, which disables propagation of topology changes:

```
switch(config-if)# spanning-tree tcn-guard
```

Disabling `tcn-guard`, which enables propagation of topology changes:

```
switch(config-if)# no spanning-tree tcn-guard
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## spanning-tree vlan

```
spanning-tree vlan <VLAN-LIST> [{hello-time | foward-delay | max-age | priority} <VALUE>]
no spanning-tree vlan <VLAN-LIST> [hello-time | foward-delay | max-age | priority]
```

### Description

Creates an RPVST instance for the specified VLAN. This command also allows for configuration of RPVST instance-specific time parameters.

The **no** form of this command removes the RPVST instance associated with the specified VLAN, and configures default values for RPVST instance-specific parameters.

| Parameter | Description |
|---|---|
| `<VLAN-LIST>` | Specifies the number of a single VLAN, or a series of numbers for a range of VLANs, separated by commas (1, 2, 3, 4), dashes (1-4), or both (1-4,6). |
| `hello-time <VALUE>` | Specifies the hello-time in seconds for the RPVST instance. Range: 2-10 seconds. Default: 2 seconds. |
| `forward-delay <VALUE>` | Specifies the forward-delay time in seconds for the RPVST instance. Range: 4-30 seconds. Default: 15 seconds. |
| `max-age <VALUE>` | Specifies the maximum age time in seconds for the RPVST instance. Range: 6-40 seconds. Default: 20 seconds. |
| `priority <VALUE>` | Specifies the priority for the RPVST instance. Priority value is |

| Parameter | Description |
|---|---|
|  | configured as a multiple of 4096. Range: 0-15. Default: 8 which is 32768. |

### Examples

Creating an RPVST instance for a list of VLANs and configuring various time parameters:

```
switch# config
switch(config)# spanning-tree vlan 2-5
switch(config)# spanning-tree vlan 2-5 hello-time 5
switch(config)# spanning-tree vlan 5 max-age 10
switch(config)# spanning-tree vlan 2-5 forward-delay 25
switch(config)# spanning-tree vlan 2-5 priority 5
```

Removing an RPVST instance for a list of VLANs and setting various time parameters to the default:

```
switch# config
switch(config)# no spanning-tree vlan 2-5
switch(config)# no spanning-tree vlan 2-5 hello-time
switch(config)# no spanning-tree vlan 2-5 forward-time
switch(config)# no spanning-tree vlan 2-5 max-age
switch(config)# no spanning-tree vlan 2-5 priority
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# spanning-tree vlan cost

```
spanning-tree vlan <VLAN-LIST> cost <PORT-COST>
no spanning-tree vlan <VLAN-LIST> cost
```

### Description

Configures the spanning tree cost for the VLAN. This is the cost to reach the root port.

The **no** form of this command sets the port cost to the default value.

| Parameter | Description |
|---|---|
| *<VLAN-LIST>* | Specifies the number of a single VLAN, or a series of numbers for a range of VLANs, separated by commas (1, 2, 3, 4), dashes (1-4), or both (1-4,6). |
| *<PORT-COST>* | Specifies the spanning tree cost for the VLAN. Range: 1-200,000,000. Default is calculated from the port link speed:<br>■ 10 Mbps link speed equals a path cost of 2,000,000.<br>■ 100 Mbps link speed equals a path cost of 200,000.<br>■ 1 Gbps link speed equals a path cost of 20,000.<br>■ 2 Gbps link speed equals a path cost of 10,000.<br>■ 10 Gbps link speed equals a path cost of 2,000.<br>■ 100 Gbps link speed equals a path cost of 200.<br>■ 1 Tbps link speed equals a path cost of 20. |

### Examples

Setting port cost:

```
switch(config-if)# spanning-tree vlan 5 cost 100000
```

Setting port cost to the default:

```
switch(config-if)# no spanning-tree vlan 5 cost
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## spanning-tree vlan port-priority

```
spanning-tree vlan <VLAN-LIST> port-priority <PRIORITY>
no spanning-tree vlan <VLAN-LIST> port-priority
```

### Description

Configures port priority. A port with the lowest priority number has the highest priority for use in forwarding traffic.

The **no** form of this command, sets the port priority to the default of 8.

| Parameter | Description |
|---|---|
| *<VLAN-LIST>* | Specifies the number of a single VLAN, or a series of numbers for a range of VLANs, separated by commas (1, 2, 3, 4), dashes (1-4), or both (1-4,6). |
| *<PRIORITY>* | Specifies the port priority. The value, configured as a multiple of 16, helps in determining the designated port. The lower a priority value, the higher the priority. Range: 1 to15. Default: 8. |

### Examples

Setting port priority:

```
switch(config-if)# spanning-tree vlan 5 port-priority 10
```

Setting port priority to the default of 8:

```
switch(config-if)# no spanning-tree vlan 5 port-priority
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## spanning-tree trap

```
spanning-tree trap {new-root | topology-change [vlan <VLAN-ID>] |
   errant-bpdu | root-guard-inconsistency | loop-guard-inconsistency}
no spanning-tree trap {new-root | topology-change [vlan <VLAN-ID>] |
   errant-bpdu | root-guard-inconsistency | loop-guard-inconsistency}
```

### Description

Enables SNMP traps for new root, topology change event, errant-bpdu received event, root-guard inconsistency, and loop-guard inconsistency notifications. It is disabled by default.

The **no** form of this command disables the notifications for SNMP traps.

| Parameter | Description |
|---|---|
| new-root | Enables SNMP notification when a new root is elected on any PVST vlan on the switch. |
| topology-change | Enables SNMP notification when a topology change event occurred in specified PVST vlan on the switch. |
| *<VLAN-ID>* | Specifies the VLAN ID for the topology change trap. Range: 1 to 4094. |
| errant-bpdu | Enables SNMP notification when an errant bpdu is received by any PVST vlan on the switch. |
| root-guard-inconsistency | Enables SNMP notification when the root-guard finds the port inconsistent for any PVST vlan on the switch. |
| loop-guard-inconsistency | Enables SNMP notification when the loop-guard finds the port inconsistent for any PVST vlan on the switch. |

## Examples

Enabling the notifications for the SNMP traps:

```
switch(config)# spanning-tree trap
  new-root                  Enable notifications which are sent when a new root is
elected
  topology-change           Enable notifications which are sent when a topology
change occurs
  errant-bpdu               Enable notifications which are sent when an errant
bpdu is received
  root-guard-inconsistency  Enable notifications which are sent when root guard
inconsistency occurs
  loop-guard-inconsistency  Enable notifications which are sent when loop guard
inconsistency occurs
switch(config)# spanning-tree trap new-root
  <cr>
switch(config)# spanning-tree trap topology-change
  vlan  Enable topology change notification for the specified PVST vlan id.
switch(config)# spanning-tree trap topology-change vlan
  <1-4094>  Enable topology change information on the specified vlan id.
switch(config)# spanning-tree trap topology-change vlan 1
  <cr>
switch(config)# spanning-tree trap errant-bpdu
  <cr>
switch(config)# spanning-tree trap root-guard-inconsistency
  <cr>
switch(config)# spanning-tree trap loop-guard-inconsistency
  <cr>
```

Disabling the notifications for the SNMP traps:

```
switch(config)# no spanning-tree trap
  new-root                  Disable notifications which are sent when a new root
is elected
  topology-change           Disable notifications which are sent when a topology
change occurs
  errant-bpdu               Disable notifications which are sent when an errant
bpdu is received
```

```
  root-guard-inconsistency  Disable notifications which are sent when root guard
inconsistency occurs
  loop-guard-inconsistency  Disable notifications which are sent when loop guard
inconsistency occurs
switch(config)# no spanning-tree trap new-root
  <cr>
switch(config)# no spanning-tree trap topology-change
  instance  Disable topology change notification for the specified PVST vlan id.
switch(config)# no spanning-tree trap topology-change vlan
  <1-4094>  Disable topology change information on the specified PVST vlan id.
switch(config)# no spanning-tree trap topology-change vlan 1
  <cr>
switch(config)# no spanning-tree trap errant-bpdu
  <cr>
switch(config)# no spanning-tree trap root-guard-inconsistency
  <cr>
switch(config)# no spanning-tree trap loop-guard-inconsistency
  <cr>
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# Chapter 138

# Runtime diagnostic commands

## diagnostic monitor

```
diagnostic monitor {fan-tray  | line-module | management-module} [<SLOT-ID>]
no diagnostic monitor {fan-tray  | line-module | management-module} [<SLOT-ID>]
```

For 6400 switches only:

```
diagnostic monitor {fabric <SLOT-ID>}
no diagnostic monitor {fabric <SLOT-ID>}
```

### Description

Enables runtime diagnostics for all modules or for a specified module. This feature is enabled by default for all modules.

The **no** form of this command disables runtime diagnostics for all modules or for a specified module.

| Parameter | Description |
|---|---|
| `fan-tray` | Specifies the enabling of diagnostic monitoring specific to a fan tray. |
| `line-module` | Specifies the enabling of diagnostic monitoring specific to a line module. |
| `management-module` | Specifies the enabling of diagnostic monitoring specific to a management module. |
| *<SLOT-ID>* | Specifies the slot ID of a module. Format: member/slot. |

### Usage

When no parameters are used in the command (**diagnostic monitor** or **no diagnostic monitor**), the command applies to all modules. This command impacts the diagnostics that run periodically. It does not affect on-demand diagnostics.

### Example

Enabling runtime diagnostics for a specified module:

```
switch(config)# diagnostic monitor management-module 1/1
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## diag on-demand

```
diag on-demand {fan-tray  | line-module | management-module} [<SLOT-ID>]
```

For 6400 switches only:

```
diag on-demand {fabric <SLOT-ID>}
```

### Description

Runs the diagnostic tests for all modules or for a specified module.

| Parameter | Description |
|---|---|
| `[fan-tray | line-module | management-module]` | Selects the options for enabling or disabling run-time diagnostics for a specific module. |
| `fan-tray` | Specifies the enabling of diagnostic monitoring specific to a fan tray. |
| `line-module` | Specifies the enabling of diagnostic monitoring specific to a line module. |
| `management-module` | Specifies the enabling of diagnostic monitoring specific to a management module. |
| *<SLOT-ID>* | Specifies the member/slot for management modules (1/1 or 1/2), line modules (1/3-1/7, 1/8-1/12), fan trays (1/1-1/3), and fabric modules (1/1-1/2) on a 6400 switch.<br>Specifies the member/slot for management modules (1/1), line modules (1/1), and fan trays (1/1-1/2) on a 6300 switch. |

### Usage

When no parameters are used in the command (**diag on-demand**), the command applies to all modules.

### Examples

Running diagnostic tests for all modules on a 6300 switch:

```
switch# diag on-demand
Fetching Test results.  Please wait ...
```

```
Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
FanTray              1/2             1     100%
FanTray              1/1             1     100%
LineModule           1/1            13     100%
ManagementModule     1/1            13     100%
```

Running diagnostic tests for a specific module on a 6300 switch:

```
switch# diag on-demand management-module 1/1
Performing diagnostic tests.  Please wait ...
Fetching Test results.  Please wait ...

Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
ManagementModule     1/1            13     100%
```

Running diagnostic tests for all modules on a 6400 switch:

```
switch# diag on-demand
Fetching Test results.  Please wait ...

Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
FanTray              1/2             2     100%
LineModule           1/3            24     100%
ManagementModule     1/1            19     100%
LineModule           1/7            12     100%
Fabric               1/1             6     100%
LineModule           1/5            24     100%
LineModule           1/4            24     100%
FanTray              1/1             2     100%
LineModule           1/6            24     100%
```

Running diagnostic tests for a specific module on a 6400 switch:

```
switch# diag on-demand management-module
Performing diagnostic tests.  Please wait ...
Fetching Test results.  Please wait ...

Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
ManagementModule     1/1            19     100%
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show diagnostic

`show diagnostic {fan-tray  | line-module | management-module} [<SLOT-ID>] {brief | detail} [vsx-peer]`

### Description

Displays the diagnostic test results for all modules or for a specified module.

| Parameter | Description |
|---|---|
| `[fan-tray | line-module | management-module]` | Selects the options for enabling or disabling runtime diagnostics for a specific module. |
| `fan-tray` | Specifies the enabling of diagnostic monitoring specific to a fan tray. |
| `line-module` | Specifies the enabling of diagnostic monitoring specific to a line module. |
| `management-module` | Specifies the enabling of diagnostic monitoring specific to a management module. |
| *`<SLOT-ID>`* | Specifies the member/slot for management modules (1/1), line modules (1/1), and fan trays (1/1-1/2) on the 6300 switch. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

When no parameters are used in the command (**show diagnostic**), the command applies to all modules.

### Example

Showing diagnostic test results in brief format for all modules on a 6300 switch:

```
switch# show diagnostic brief
Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
```

```
ManagementModule     1/1           13     100%
LineModule           1/1           13     100%
FanTray              1/1            1     100%
FanTray              1/2            1     100%
```

Showing diagnostic test results in brief format for a specified module on a 6300 switch:

```
switch# show diagnostic line-module brief

Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
LineModule           1/1           13     100%
```

Showing diagnostic test results in detail format for all modules on a 6300 switch:

```
switch# show diagnostic detail

Module : ManagementModule 1/1

Diagnostic     Status Error Code History Code Successive    Total Failure Total
  Last Run Timestamp   First Run Timestamp
                                              Failure Count Count
Iteration
-------------- ------ ---------- ------------ ------------- ------------- --------
-  -------------------- -------------------
ddr_cecount    Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:38  2019-07-31 07:44:55
emmc           Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
fan_ctrlr      Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
fepld          Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:38  2019-07-31 07:44:54
fru_eeprom     Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:54
fru_eeprom_ul  Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:54
mm_lcb         Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:37  2019-07-31 07:44:54
pmc            Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:37  2019-07-31 07:44:54
rdimm_spd      Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
rdimm_tmp      Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
rtc            Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
tmp1           Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
tmp2           Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55


Module : LineModule 1/1

Diagnostic     Status Error Code History Code Successive    Total Failure Total
  Last Run Timestamp   First Run Timestamp
                                              Failure Count Count
```

```
Iteration
-------------- ------ ---------- ------------ ------------- ------------- --------
-  -------------------- -------------------
lc_asic        Pass   0x0        0x0                      0             0
108  2019-07-31 16:43:37  2019-07-31 07:46:03
poe_ctrlr_1_q1 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:03
poe_ctrlr_1_q2 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:04
poe_ctrlr_1_q3 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:04
poe_ctrlr_2_q1 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:05
poe_ctrlr_2_q2 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:05
poe_ctrlr_2_q3 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:05
poe_ctrlr_3_q1 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:06
poe_ctrlr_3_q2 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:16  2019-07-31 07:46:06
poe_ctrlr_3_q3 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:17  2019-07-31 07:46:06
poe_ctrlr_4_q1 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:17  2019-07-31 07:46:07
poe_ctrlr_4_q2 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:17  2019-07-31 07:46:07
poe_ctrlr_4_q3 Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:17  2019-07-31 07:46:08


Module : FanTray 1/1

Diagnostic     Status Error Code History Code Successive    Total Failure Total
  Last Run Timestamp   First Run Timestamp
                                              Failure Count Count
Iteration
-------------- ------ ---------- ------------ ------------- ------------- --------
-  -------------------- -------------------
ft1_eeprom     Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:33  2019-07-31 07:44:54


Module : FanTray 1/2

Diagnostic     Status Error Code History Code Successive    Total Failure Total
  Last Run Timestamp   First Run Timestamp
                                              Failure Count Count
Iteration
-------------- ------ ---------- ------------ ------------- ------------- --------
-  -------------------- -------------------
ft2_eeprom     Pass   0x0        0x0                      0             0
3  2019-07-31 16:07:50  2019-07-31 07:44:54
```

Showing diagnostic test results in detail format for a specified module on a 6300 switch:

```
switch# show diagnostic management-module detail

Module : ManagementModule 1/1

Diagnostic     Status Error Code History Code Successive    Total Failure Total
```

```
  Last Run Timestamp   First Run Timestamp
                                              Failure Count Count
Iteration
-------------- ------ ---------- ------------ ------------- ------------- --------
-  -------------------- -------------------
ddr_cecount    Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:38  2019-07-31 07:44:55
emmc           Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
fan_ctrlr      Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
fepld          Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:38  2019-07-31 07:44:54
fru_eeprom     Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:54
fru_eeprom_ul  Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:54
mm_lcb         Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:37  2019-07-31 07:44:54
pmc            Pass   0x0        0x0                      0             0
109  2019-07-31 16:43:37  2019-07-31 07:44:54
rdimm_spd      Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
rdimm_tmp      Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
rtc            Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
tmp1           Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
tmp2           Pass   0x0        0x0                      0             0
4  2019-07-31 16:08:04  2019-07-31 07:44:55
```

Showing diagnostic test results in brief format for all modules on a 6400 switch:

```
switch# show diagnostic brief

Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
ManagementModule     1/1           19     100%
LineModule           1/3           24     100%
LineModule           1/7           12     100%
LineModule           1/5           24     100%
LineModule           1/4           24     100%
LineModule           1/6           24     100%
Fabric               1/1            6     100%
FanTray              1/2            2     100%
FanTray              1/1            2     100%
```

Showing diagnostic test results in brief format for a specified module on a 6400 switch:

```
switch# show diagnostic management-module brief

Module               ID    Diagnostics Success
                           Performed
-------------------- ----- ----------- -------
ManagementModule     1/1           19     100%
```

Showing diagnostic test results in detail format for a specified module on a 6400 switch:

```
switch# show diagnostic management-module detail

Module : ManagementModule 1/1

Diagnostic     Status Error Code History Code Successive    Total Failure Total
  Last Run Timestp
                                              Failure Count Count
Iteration
-------------- ------ ---------- ------------ ------------- ------------- --------
-  ----------------
curr_sensor    Pass   0x0        0x0                      0             0
2  2019-10-14 00:25
ddr_cecount    Pass   0x0        0x0                      0             0
34  2019-10-14 01:26
eeprom         Pass   0x0        0x0                      0             0
2  2019-10-14 00:25
eeprom_ul      Pass   0x0        0x0                      0             0
2  2019-10-14 00:25
emmc           Pass   0x0        0x0                      0             0
2  2019-10-14 00:26
icbbp          Pass   0x0        0x0                      0             0
34  2019-10-14 01:24
icbx           Pass   0x0        0x0                      0             0
34  2019-10-14 01:25
ledpld         Pass   0x0        0x0                      0             0
34  2019-10-14 01:24
mm_mcb         Pass   0x0        0x0                      0             0
34  2019-10-14 01:24
psu1           Pass   0x0        0x0                      0             0
2  2019-10-14 00:27
psu1_eeprom    Pass   0x0        0x0                      0             0
2  2019-10-14 00:26
psu2           Pass   0x0        0x0                      0             0
2  2019-10-14 00:27
psu2_eeprom    Pass   0x0        0x0                      0             0
2  2019-10-14 00:27
rdimm_spd      Pass   0x0        0x0                      0             0
2  2019-10-14 00:26
rdimm_tmp      Pass   0x0        0x0                      0             0
2  2019-10-14 00:26
rtc            Pass   0x0        0x0                      0             0
2  2019-10-14 00:26
tmp1           Pass   0x0        0x0                      0             0
2  2019-10-14 00:25
tmp2           Pass   0x0        0x0                      0             0
2  2019-10-14 00:25
tmp3           Pass   0x0        0x0                      0             0
2  2019-10-14 00:25
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show diagnostic events

`show diagnostic events`

### Description

Displays the diagnostic related event logs.

### Example

Showing diagnostic related event logs:

```
switch# show diagnostic events
2019-08-07:17:19:21.214532|hhmd|106001|ERR|
Diagnostic mm_mcbe failed with error code 0x380 on management module 1/1
2019-08-07:17:19:21.214554|hhmd|106001|ERR|
Diagnostic pmc failed with error code 0x4 on management module 1/1
2019-08-07:17:19:21.215532|hhmd|106001|ERR|
Diagnostic ledpld failed with error code 0x4 on management module 1/1
2019-08-07:17:19:21.353221|hhmd|106001|ERR|
Diagnostic mm_mcbe failed with error code 0x380 on management module 1/1
2019-08-07:17:19:21.354421|hhmd|106001|ERR|
Diagnostic pmc failed with error code 0x4 on management module 1/1
2019-08-07:17:19:21.453221|hhmd|106001|ERR|
Diagnostic ledpld failed with error code 0x4 on management module 1/1
```

Showing diagnostic related event logs (Output from a 6400 switch):

```
switch# show diagnostic events
---------------------------------------------------
Event logs from current boot
---------------------------------------------------
2019-10-17T20:27:04.066486+00:00 6405 hhmd[9237]: Event|3002|LOG_
ERR|LC|1/6|Diagnostic brd_tmp1 failed with error code 0x1000000 on line card 4
2019-10-17T20:27:04.102968+00:00 6405 hhmd[9237]: Event|3002|LOG_
ERR|LC|1/3|Diagnostic brd_tmp1 failed with error code 0x1000000 on line card 1
2019-10-17T20:27:04.117467+00:00 6405 hhmd[9237]: Event|3002|LOG_
ERR|LC|1/5|Diagnostic brd_tmp1 failed with error code 0x1000000 on line card 3
2019-10-17T20:27:04.210276+00:00 6405 hhmd[9237]: Event|3002|LOG_
ERR|LC|1/4|Diagnostic brd_tmp1 failed with error code 0x1000000 on line card 2
2019-10-17T20:27:04.212133+00:00 6405 hhmd[9237]: Event|3002|LOG_
ERR|LC|1/7|Diagnostic brd_tmp1 failed with error code 0x1000000 on line card 5
```

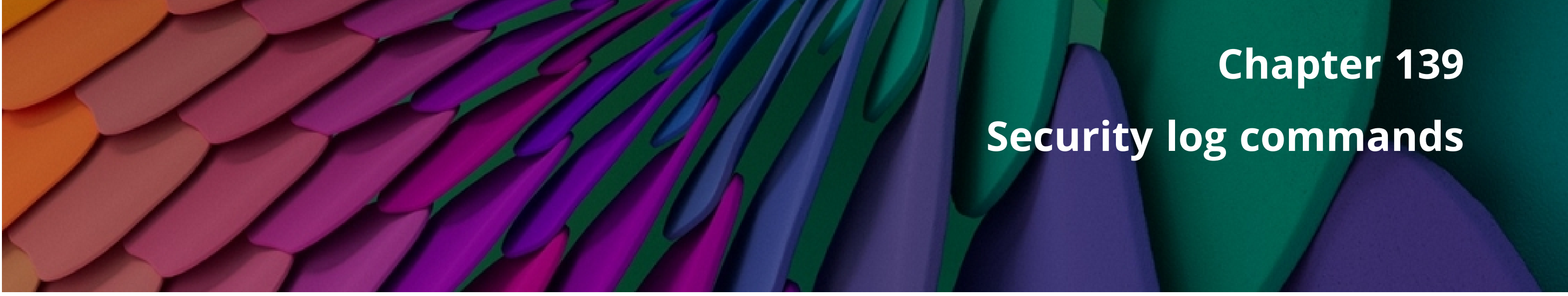
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 139

# Security log commands

## clear security-logs

`clear security-logs`

### Description

Clears the security logs.

Only members of the security user group have permission to use this command.

### Examples

Showing the current boot security logs and then clearing the security logs:

```
switch# show security-logs
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
2021-12-01:12:37:32.583256|hpe-credmgr|24002|WARN|AMM|1|An internal error occurred
while reading the export password and default export password was used instead.

switch# clear security-logs

switch# show security-logs
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | The security user. |

## copy security-log

`copy security-log <REMOTE-URL> [vrf <VRF-NAME>]`

### Description

Copies the security logs to a remote URL using SFTP, SCP, or TFTP.

Only members of the security user group have permission to use this command.

| Parameter | Description |
|---|---|
| *<REMOTE-URL>* | Specifies the remote destination URL.<br>URL Syntax:<br>▪ **sftp://<*USER*>@{<*IP*>\|<*HOST*>}[:<*PORT*>]/<*FILE*>**<br>▪ **scp://<*USER*>@{<*IP*>\|<*HOST*>}[:<*PORT*>]/<*FILE*>**<br>▪ **tftp://{<*IP*>\|<*HOST*>}[:<*PORT*>][;blocksize=<*VAL*>]/<*FILE*>** |
| vrf *<VRF-NAME>* | Specifies the VRF name. When omitted, the VRF named *default* is used. |

### Examples

Copying the security log with SFTP:

```
switch# copy security-log sftp://user1@99.99.99.99/coredump.xz vrf mgmt
```

Copying the security log with SCP:

```
switch# copy security-log scp://user2@99.99.99.99/coredump.xz vrf mgmt
```

Copying the security log with TFTP:

```
switch# copy security-log tftp://99.99.99.99:9999/coredump.xz vrf mgmt
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | The security user. |

## show security-logs

```
show security-logs {-s <SEVERITY> | -r | -a | -n <COUNT>
                        | -d {lldpd | bgpd | fand | ...}}
```

### Description

Shows the security logs. Multiple parameters can be used in the same command.

Only members of the security user group have permission to use this command.

| Parameter | Description |
|---|---|
| `-s <SEVERITY>` | Shows the event logs for the specified severity.<br>■ **emer**: Emergency (7) only.<br>■ **alert**: Alerts (6) and above.<br>■ **crit**: Critical (5) and above.<br>■ **err**: Error (4) and above.<br>■ **warn**: Warning (3) and above.<br>■ **notice**: Notice (2) and above.<br>■ **info**: Info (1) and above.<br>■ **debug**: All severity levels. |
| `-r` | Shows the security logs in reverse order with the most recent log items first. |
| `-a` | Shows all security logs, including items from previous boots. |
| `-n <COUNT>` | Shows the specified number of security log items. Range: 1 to 4294967295. |
| `-d {lldpd \| bgpd \| fand \|...}` | Shows the security logs for the specified daemon. |

### Examples

Showing security logs from the current boot:

```
switch# show security-logs
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
2021-12-01:12:37:32.583256|hpe-credmgr|24002|WARN|AMM|1|An internal error occurred
while reading the export password and default export password was used instead.
```

Showing security logs in reverse order with the most recent logs first: :

```
switch# show security-logs -r
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:32.583256|hpe-credmgr|24002|WARN|AMM|1|An internal error occurred
while reading the export password and default export password was used instead.
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
2021-12-01:12:37:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
```

Showing security logs from the current and previous boot:

```
switch# show security-logs -a
---------------------------------------------------
Security logs from previous boot
---------------------------------------------------
2021-12-01:12:31:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
2021-12-01:12:31:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
2021-12-01:12:37:32.583256|hpe-credmgr|24002|WARN|AMM|1|An internal error occurred
while reading the export password and default export password was used instead.
```

Showing security logs with a severity of **warn** and higher:

```
switch# show security-logs -s warn
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
2021-12-01:12:37:32.583256|hpe-credmgr|24002|WARN|AMM|1|An internal error occurred
while reading the export password and default export password was used instead.
```

Showing security logs for the specified daemon :

```
switch# show security-logs -d hpe-restd
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
```

Showing the two most recent security logs:

```
switch# show security-logs -n 2
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
```

Showing the two most recent security logs in reverse order for the specified daemon:

```
switch# show security-logs -r -n 2 -d hpe-restd
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:31.734541|restd|4001|WARN|AMM|1|User auditor password change
failed
2021-12-01:12:37:31.733551|restd|15007|INFO|AMM|1|User admin successfully changed
password
```

Showing the two most recent security logs with a severity of **error** and higher for the specified daemon:

```
switch# show security-logs -s err -n 2 -d hpe-credmgr
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:32.583256|hpe-credmgr|7715|ERR|AMM|1|Failed to download CA
certificates from EST server server_1
2021-12-01:12:38:32.583256|hpe-credmgr|7712|ERR|AMM|1|Application association with
the root_one certificate is not permitted
```

Showing security logs with a severity of **critical** and higher for the specified daemon:

```
switch# show security-logs -s crit -d ipsavd
---------------------------------------------------
Security logs from current boot
---------------------------------------------------
2021-12-01:12:37:32.583256|ipsavd|9802|CRIT|AMM|1|IP_SOURCE_LOCKDOWN resource
utilization has exceeded maximum supported limit of 8192 on the system. IP source-
lockdown functionality will not work for new entries
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | The security user. |

# Chapter 140

# Selftest commands

## fastboot

```
fastboot
no fastboot
```

### Description

Enables fastboot for the system.

The **no** form of this command disables fastboot for the system.

### Usage

When fastboot is enabled, most tests under a Power On Self Test (POST) are skipped. By default, fastboot is enabled.

After disabling fastboot, save switch configurations and then reboot for POST to run. POST verifies the hardware functionality of various modules during boot-up. Based on the criticality of the test, the selftest module decides whether to go ahead with the boot-up sequence of a particular subsystem or interface during a POST failure.

POST runs memory built-in selftest (BISTs) and front-end port loopback tests. Memory BISTs verify the internal and external memory blocks present in the module. The memory tables are critical for proper functionality of the system so any failures in these tests results in the corresponding subsystem to be marked as "Failed" and thus that subsystem is not available for use.

Front-end port loopback tests verify the physical port front-end interface. These tests check if a particular interface can function properly. A test failure means that a particular interface has been marked as "Failed" and is now unavailable for use.

On 6300 and 6400 switches, the line-module and fabric-module selftest is run regardless of fastboot setting. The interface selftest is only run when fastboot is disabled.

### Examples

Enabling fastboot:

```
switch# configure terminal
switch(config)# fastboot
switch(config)# end
switch# show running-config
Current configuration:
!
!Version AOS-CX ML.10.06.0001
module 1/1 product-number jl726a!Version AOS-CX FL.10.06.0001
module 1/1 product-number jl661a!Version AOS-CX XL.10.00.0002
module 1/1 product-number jl363a!Version AOS-CX PL.10.06.0001
module 1/1 product-number jl677a
!
!
!
```

```
!
!
!
!
vlan 1
interface 1/1/1
    no shutdown
```

Disabling fastboot:

```
switch# configure terminal
switch(config)# no fastboot
switch(config)# end
switch(config)# write mem
Configuration changes will take time to process, please be patient.
switch# show running-config
Current configuration:
!
!Version AOS-CX ML.10.06.0001
module 1/1 product-number jl726a!Version AOS-CX FL.10.06.0001
module 1/1 product-number jl661a!Version AOS-CX XL.10.00.0002
module 1/1 product-number jl363a!Version AOS-CX PL.10.06.0001
module 1/1 product-number jl677a
!
!
!
no fastboot
!
!
!
!
vlan 1
interface 1/1/1
    no shutdown
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show selftest

```
show selftest [brief] [vsx-peer]
show selftest line-module <SLOT-ID>
show selftest line-module <SLOT-ID> interface [brief] [vsx-peer]
show selftest interface [<PORT-NUM>] [vsx-peer]
```

For 8400 and 6400 switches only:

```
show selftest {line-module | fabric-module} [<SLOT-ID>] [brief] [vsx-peer]
```

## Description

Displays selftest results.

| Parameter | Description |
|---|---|
| `[brief]` | Shows the selftest results as a brief description. Default. |
| `line-module` | Shows the selftest results for a line module. |
| `fabric-module` | Shows the selftest results for a fabric module. Applicable only for 8400 and 6400 switches. |
| *<SLOT-ID>* | Shows the selftest results for the slot ID of the line or fabric module. |
| *<PORT-NUM>* | Shows the selftest results for the port number. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Displaying the output when fastboot is disabled on an 8400 or a 6400 switch:

```
switch# show selftest
Name        Id   Status          ErrorCode  LastRunTime
---------- ---- -------------- ---------- -------------------
LineModule 1/1  passed          0x0       2016-10-15 10:10:09
LineModule 1/2  failed          0x09      2016-10-15 10:10:56
Fabric 1/1      passed          0x0       2016-10-15 10:10:09
Fabric 1/2      failed          0x1E      2016-10-15 10:10:56

switch# show selftest line-module
Name        Id   Status          ErrorCode LastRunTime
---------- ---- -------------- --------- -------------------
LineModule 1/1  passed          0x0       2016-10-15 10:10:09
LineModule 1/2  failed          0x09      2016-10-15 10:10:56

switch# show selftest fabric-module
Name   Id        Status          ErrorCode LastRunTime
------ -------- -------------- --------- -------------------
Fabric 1/1      passed          0x0       2016-10-15 10:10:09
Fabric 1/2      failed          0x1E      2016-10-15 10:10:56

switch# show selftest fabric-module 1/2
Name   Id        Status          ErrorCode LastRunTime
------ -------- -------------- --------- -------------------
Fabric 1/2      failed          0x11      2016-10-15 10:10:56

switch# show selftest line-module 1/10
Name        Id   Status          ErrorCode LastRunTime
```

```
---------- ---- -------------- --------- -------------------
LineModule 1/10 failed         0x1A      2016-10-15 10:10:56

switch# show selftest interface 1/2/2
Name    Status         ErrorCode LastRunTime
------- -------------- --------- -------------------
1/2/2   passed         0x0       2016-11-19 05:10:11

switch# show selftest line-module 1/3 interface
Name    Status         ErrorCode LastRunTime
------- -------------- --------- -------------------
1/3/1   passed         0x0       2016-11-19 05:10:11
1/3/2   passed         0x0       2016-11-19 05:10:11
1/3/3   passed         0x0       2016-11-19 05:10:11
1/3/31  failed         0x20      2016-11-19 05:10:11
```

Displaying the output when fastboot is disabled on a 6300 switch:

```
switch# show selftest interface




Name       Status            ErrorCode        LastRunTime



---------- ----------------- ---------------- -------------------



1/1/2      skipped           0x0


1/1/44     skipped           0x0


1/1/46     skipped           0x0

switch# show selftest interface 1/1/1

Name       Status            ErrorCode        LastRunTime
---------- ----------------- ---------------- -------------------
1/1/1      skipped           0x0
```

Displaying the output when fastboot is enabled on a 6400 switch:

```
switch# show selftest
Name       Id   Status         ErrorCode  LastRunTime
---------- ---- -------------- ---------- -------------------
LineModule 1/1  passed         0x0
LineModule 1/2  passed         0x0
Fabric     1/1  passed         0x0
Fabric     1/2  passed         0x0

switch# show selftest line-module
Name       Id   Status         ErrorCode LastRunTime
---------- ---- -------------- --------- -------------------
LineModule 1/1  passed         0x0
LineModule 1/2  passed         0x0
```

```
switch# show selftest fabric-module
Name       Id   Status         ErrorCode  LastRunTime
---------- ---- -------------- ---------- -------------------
Fabric     1/1  passed         0x0
Fabric     1/2  passed         0x0

switch# show selftest fabric-module 1/2
Name   Id       Status         ErrorCode LastRunTime
------ -------- -------------- --------- -------------------
Fabric 1/2      passed         0x0

switch# show selftest line-module 1/1
Name       Id   Status         ErrorCode LastRunTime
---------- ---- -------------- --------- -------------------
LineModule 1/1  passed         0x0
```

Displaying the output when fastboot is enabled:

```
switch# show selftest interface 1/1/2
Name    Status         ErrorCode LastRunTime
------- -------------- --------- -------------------
1/1/2   skipped        0x0

switch# show selftest line-module 1/1 interface
Name    Status         ErrorCode LastRunTime
------- -------------- --------- -------------------
1/1/1   skipped        0x0
1/1/2   skipped        0x0
1/1/3   skipped        0x0
1/1/31  skipped        0x0
```

Displaying the output when fastboot is disabled:

Testing to register read/write:

This test is run irrespective of fastboot being enabled or disabled.

```
switch# show selftest

Name       Id   Status         ErrorCode  LastRunTime
---------- ---- -------------- ---------- -------------------
LineModule 1/1  passed         0x0        2018-02-16 18:15:53
```

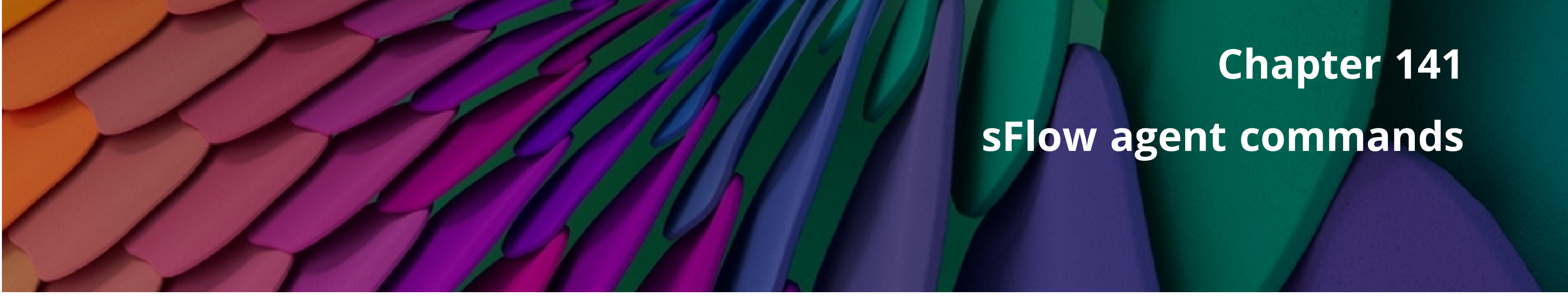
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |



# Chapter 141

# sFlow agent commands

## clear sflow statistics

```
clear sflow statistics {global | interface <INTERFACE-NAME>}
```

### Description

This command clears the sFlow sample statistics counter to 0 either globally or for a specific interface.

| Parameter | Description |
|---|---|
| `global` | Specifies all interfaces on the switch. |
| `interface <INTERFACE-NAME>` | Specifies the name of an interface on the switch. |

### Examples

Clearing the global sFlow sample statistics counter to 0 globally:

```
switch(config)# clear sflow statistics global
```

Clearing the global sFlow sample statistics counter to 0 for interface *1/1/1*:

```
switch(config)# clear sflow statistics interface 1/1/1
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## sflow

```
sflow
```

```
no sflow
```

## Description

Enables the sFlow agent.

- In the **config** context, this command enables the sFlow agent globally on all interfaces.
- In an **config-if** context, this command enables the sFlow agent on a specific interface. sFlow cannot be enabled on a member of a LAG, only on the LAG.

The sFlow agent is disabled by default.

The **no** form of this command disables the sFlow agent and deletes all sFlow configuration settings, either globally, or for a specific interface.

## Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling sFlow globally on all interfaces:

```
switch(config)# sflow
```

Disabling sFlow globally on all interfaces:

```
switch(config)# no sflow
```

Enabling sFlow on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# sflow
```

Disabling sFlow on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no sflow
```

Enabling sFlow on interface **lag100**:

```
switch(config)# interface lag100
switch(config-if)# sflow
```

Disabling sFlow on interface **lag100**:

```
switch(config)# interface lag100
switch(config-if)# no sflow
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config`<br>`config-if` | Administrators or local user group members with execution rights for this command. |

## sflow agent-ip

```
sflow agent-ip <IP-ADDR>
no sflow agent-ip [<IP-ADDR>]
```

### Description

Defines the IP address of the sFlow agent to use in sFlow datagrams. This address must be defined for sFlow to function. HPE recommends that the address:

- can uniquely identify the switch
- is reachable by the sFlow collector
- does not change with time

The **no** form of this command deletes the IP address of the sFlow agent. This causes sFlow to stop working and no datagrams will be sent to the sFlow collector.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* | Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. The agent address is used to identify the switch in all sFlow datagrams sent to sFlow collectors. It is usually set to an IP address on the switch that is reachable from an sFlow collector. |

### Examples

Setting the agent address to **10.10.10.100**:

```
switch(config)# sflow agent-ip 10.0.0.100
```

Setting the agent address to **2001:0db8:85a3:0000:0000:8a2e:0370:7334**:

```
switch(config)# sflow agent-ip 2001:0db8:85a3:0000:0000:8a2e:0370:7334
```

Removing the address configuration from the switch, which results in sFlow being disabled:

```
switch(config)# no sflow agent-ip
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## sflow collector

```
sflow collector <IP-ADDR> [port <PORT>] [vrf <VRF>]
no sflow collector <IP-ADDR> [port <PORT>] [vrf <VRF>]
```

### Description

Defines a collector to which the sFlow agent sends data. Up to three collectors can be defined. At least one collector should be defined, and it must be reachable from the switch for sFlow to work.

| Parameter | Description |
|---|---|
| `collector <IP-ADDR>` | Specifies the IP address of a collector in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255, or IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| `port <PORT>` | Specifies the UDP port on which to send information to the sFlow collector. Range: 0 to 65536. Default: 6343. |
| `vrf <VRF>` | Specifies the VRF on which to send information to the sFlow collector. The VRF must be defined on the switch. If no VRF is specified, the default VRF (**default**) is used. |

### Example

Defining a collector with IP address **10.10.10.100** on UDP port **6400**:

```
switch(config)# sflow collector 10.0.0.1 port 6400
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## sflow disable

```
sflow disable
```

### Description

Disables the sFlow agent, but retains any existing sFlow configuration settings. The settings become active if the sFlow agent is re-enabled.

### Example

Disabling sFlow support:

```
switch(config)# sflow disable
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## sflow header-size

```
sflow header-size <SIZE>
no sflow header-size [<SIZE>]
```

### Description

Sets the sFlow header size in bytes.

The **no** form of this command sets the header size to the default value of 128.

| Parameter | Description |
|---|---|
| `header-size <SIZE>` | Specifies the sFlow header size in bytes. Range: 64 to 256. Default: 128. |

### Examples

Setting the header size to **64** bytes:

```
switch(config)# sflow header-size 64
```

Setting the header size to the default value of **128** bytes:

```
switch(config)# no sflow header-size
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## sflow max-datagram-size

```
sflow max-datagram-size <SIZE>
no sflow max-datagram-size [<SIZE>]
```

### Description

Sets the maximum number of bytes that are sent in one sFlow datagram.

The **no** form of this command sets maximum number of bytes to the default value of 1400.

| Parameter | Description |
|---|---|
| `max-datagram-size <SIZE>` | Specifies the maximum datagram size in bytes. Range: 1 to 9000. Default: 1400. |

### Examples

Setting the datagram size to **1000** bytes:

```
switch(config)# sflow max-datagram-size 1000
```

Setting the header size to the default value of **1400** bytes:

```
switch(config)# no sflow max-datagram-size
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## sflow mode

```
sflow mode {ingress | egress | both}
no sflow mode {ingress | egress | both}
```

### Description

Sets the sFlow sampling mode. The default mode is ingress.

The no form of the command sets the sampling mode to ingress. Executing the no form of the command with the ingress option will have no impact as ingress is the default mode.

| Parameter | Description |
|---|---|
| `ingress` | Samples only ingress traffic. |
| `egress` | Samples only egress traffic. |
| `both` | Samples both ingress and egress traffic. |

### Examples

Setting the sFlow mode to only sample egress traffic:

```
switch# configure terminal
switch(config)# sflow mode egress
```

Setting the sFlow mode to only sample ingress traffic:

```
switch# configure terminal
switch(config)# sflow mode ingress
```

Setting the sFlow mode to sample both sample ingress and egress traffic:

```
switch# configure terminal
switch(config)# sflow mode both
```

Resetting the sFlow sampling mode to the default of ingress from previously configured mode of egress:

```
switch# configure terminal
switch(config)# no sflow mode egress
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config | Administrators or local user group members with execution rights for this command. |

## sflow polling

```
sflow polling <INTERVAL>
no sflow polling [<INTERVAL>]
```

### Description

Defines the global polling interval for sFlow in seconds.

The **no** form of this command sets the polling interval to the default value of 30 seconds.

| Parameter | Description |
|---|---|
| *<INTERVAL>* | Specifies the polling interval in seconds. Range: 10 to 3600. Default: 30. |

### Examples

Setting the polling interval to 10:

```
switch(config)# sflow polling 10
```

Setting the polling interval to the default value.

```
switch(config)# no sflow polling
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## sflow sampling

```
sflow sampling <RATE>
no sflow sampling [<RATE>]
```

### Description

Defines the global sampling rate for sFlow in number of packets. The default sampling rate is 4096, which means that one in every 4096 packets is sampled. A warning message is displayed when the sampling rate is set to less than 4096 and proceeds only after user confirmation.

The **no** form of this command sets the sampling rate to the default value of 4096.

| Parameter | Description |
|---|---|
| `sampling <RATE>` | Specifies the sampling rate. Range: 1 to 1000000000. Default: 4096. |

### Examples

Setting the sampling rate to **5000**:

```
switch(config)# sflow sampling 5000
```

Setting the sampling rate to the default:

```
switch(config)# no sflow sampling
```

Setting the sampling rate to **1000**:

```
switch(config)# sflow sampling 1000
Setting the sFlow sampling rate lower than 4096 is not recommended and might
affect system performance.
Do you want to continue [y/n]? y
switch(config)#
```

For more information on features that use this command, refer to the IP Services Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show sflow

```
show sflow [interface <INTERFACE-NAME>] [vsx-peer]
```

### Description

Shows sFlow configuration settings and statistics for all interfaces, or for a specific interface. It also displays the current status of sFlow on the device and reports any errors that require attention.

If sFlow is enabled on the interfaces associated with a lag interface, then the interfaces will not be shown as separate entries under `sFlow enabled on Interface` in the output. Only the associated lag interface will have an entry in the column.

| Parameter | Description |
|---|---|
| `interface <INTERFACE-NAME>` | Specifies the name of an interface on the switch. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Showing sFlow information for all interfaces:

```
switch# show sflow
sFlow Global Configuration
-----------------------------------------
sFlow                         enabled
Collector IP/Port/Vrf         10.0.0.2/6343/default
                              10.0.0.3/6400/default
Agent Address                 10.0.0.1
Sampling Rate                 1024
Polling Interval              30
Header Size                   128
Max Datagram Size             1400
Sampling Mode                 ingress

sFlow Status
-----------------------------------------
Running - Yes

sFlow enabled on Interfaces:
-----------------------------------------
1/1/2
1/1/3
lag100

sFlow Statistics
-----------------------------------------
Number of Ingress Samples     200
Number of Egress Samples      120
```

Showing sFlow information for interface **1/1/1**:

```
switch# show sflow interface 1/1/1
sFlow configuration - Interface 1/1/1
-----------------------------------------
sFlow                         enabled
Sampling Rate                 1024
Sampling Mode                 both
Number of Ingress Samples     81
Number of Egress Samples      20
sFlow Sampling Status         success
```

Showing sFlow information for interface **lag 10**:

```
switch# show sflow interface lag 10
sFlow Configuration - Interface lag10
-----------------------------------------
sFlow                         enabled
Sampling Rate                 4096
Sampling Mode                 both
Number of Ingress Samples     0
Number of Egress Samples      0
sFlow Sampling Status         error

Sampling Status on LAG members
------------------------------------
Intf 1/1/2                     no agent
Intf 1/1/3                     no agent
```

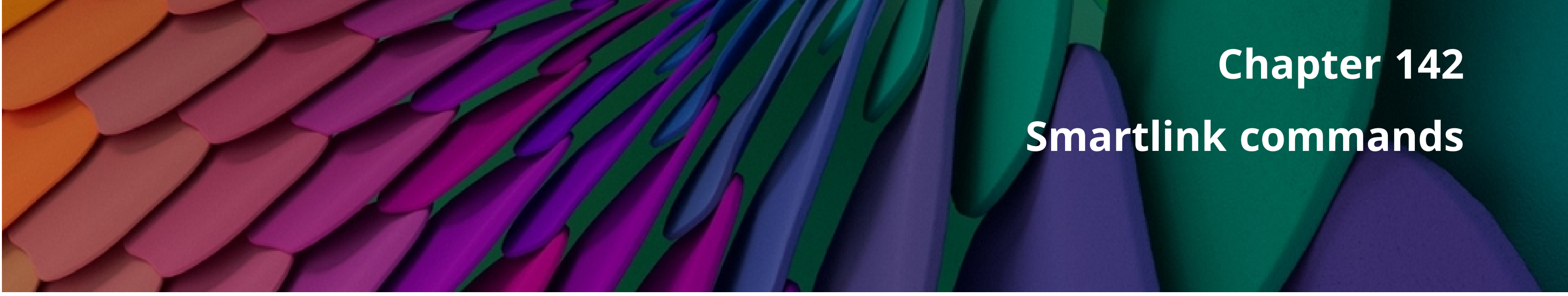
For more information on features that use this command, refer to the IP Services Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 142

# Smartlink commands

## Configuration commands

### smartlink group

```
smartlink group <GROUP-ID>
no smartlink group <GROUP-ID>
```

#### Description

Creates a Smartlink group with specified ID.

The **no** form of this command removes the Smartlink group and all associated configurations for a specified ID.

| Parameter | Description |
|---|---|
| *<GROUP-ID>* | Specifies ID for the Smartlink group. |

#### Usage

The maximum number of Smartlink groups is 24.

#### Examples

Configuring a Smartlink group:

```
switch(config)# smartlink group 2
switch(config-smartlink-2)#
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

#### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

#### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config | Administrators or local user group members with execution rights for this command. |

## smartlink recv-control-vlan

```
smartlink recv-control-vlan <VID-LIST>
no smartlink recv-control-vlan <VID-LIST>
```

### Description

Configures control VLANs to receive flush messages.

The **no** form of this command disables VLANs from receiving flush messages.

| Parameter | Description |
|---|---|
| *<VID-LIST>* | Specifies VLAN ID. |

### Usage

- Configure this command on uplink devices where MAC flush is required.
- A flush message clears stale MAC and ARP entries enabling fast traffic convergence.

### Examples

Configuring control VLAN to receive flush messages:

```
switch(config)# smartlink recv-control-vlan 2,3
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# Group context commands

## description

```
description <DESC>
no description
```

### Description

Adds description to a Smartlink group.

The **no** form of this command removes a description from a Smartlink group.

| Parameter | Description |
|---|---|
| *<DESC>* | Specifies description for a Smartlink group. 1 to 64 printable ASCII characters are allowed. |

### Examples

Adding a description to a Smartlink group:

```
switch(config)# smartlink group 3
switch(config-smartlink-3)# Description for group 3
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config-smartlink-*<GROUP>* | Administrators or local user group members with execution rights for this command. |

## diag-dump smartlink basic

```
diag-dump smartlink basic
```

### Description

Dumps the Smartlink configuration, state and statistics.

### Examples

Dump of Smartlink configuration, state, and statistics:

```
switch# diag-dump smartlink basic
==========================================================================
[Start] Feature smartlink Time : Tue Jul  7 10:08:31 2020
==========================================================================
--------------------------------------------------------------------------
[Start] Daemon smartlinkd
--------------------------------------------------------------------------
SL Group 1: Primary port 1/1/1 Secondary port 1/1/2 Control VLAN 4,
            Preemption disabled, Preemption-delay 1 Preemption Timer OFF,
            State primary_with_backup, Active port PRIMARY, Backup port SECONDARY
Port 1/1/1: member_groups 1 SL Groups ids: 1, 0
Port 1/1/2: member_groups 1 SL Groups ids: 1, 0

or

SL Group 1: Primary port lag1   (mclag: local_up_remote_up)
            Secondary port lag2 (mclag: local_down_remote_up), Control VLAN 4,
            Preemption disabled, Preemption-delay 1 Preemption Timer OFF,
            State primary_with_backup, Active port PRIMARY, Backup port SECONDARY
Port lag1: member_groups 1 SL Groups ids: 1, 0
Port lag2: member_groups 1 SL Groups ids: 1, 0
VSX Oper Status: Primary/Secondary/NA

-------------------------------------------------------------------------
[End] Daemon smartlinkd
-------------------------------------------------------------------------
-------------------------------------------------------------------------
[Start] Daemon ops-switchd
-------------------------------------------------------------------------
Group-ID | Port Name | Port Status | Vlan-ID | HW-Port-State | Vlan-Type
1        | 1/1/1     | Active      | 4       | Forwarding    | Control
1        | 1/1/1     | Active      | 3       | Forwarding    | Protected
1        | 1/1/1     | Active      | 2       | Forwarding    | Protected
1        | 1/1/1     | Active      | 1       | Forwarding    | Protected
1        | 1/1/2     | Backup      | 4       | Blocking      | Control
1        | 1/1/2     | Backup      | 3       | Blocking      | Protected
1        | 1/1/2     | Backup      | 2       | Blocking      | Protected
1        | 1/1/2     | Backup      | 1       | Blocking      | Protected

-------------------------------------------------------------------------
[End] Daemon ops-switchd
-------------------------------------------------------------------------
=========================================================================
[End] Feature smartlink
=========================================================================
Diagnostic-dump captured for feature smartlink
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## primary-port

```
primary-port <INTERFACE-NAME>
no primary-port
```

### Description

Configures primary port for a Smartlink group.

The **no** form of this command removes primary port from a Smartlink group.

| Parameter | Description |
|---|---|
| *<INTERFACE-NAME>* | Specifies interface for primary port. |

### Examples

Configuring primary port for a Smartlink group:

```
switch(config)# smartlink group 3
switch(config-smartlink-3)# primary-port 1/1/1
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config-smartlink-*<GROUP>* | Administrators or local user group members with execution rights for this command. |

## smartlink group secondary-port

```
secondary-port <INTERFACE-NAME>
no secondary-port
```

### Description

Configures secondary port for a Smartlink group.

The **no** form of this command removes secondary port from a Smartlink group.

| Parameter | Description |
|---|---|
| *<INTERFACE-NAME>* | Specifies interface for secondary port. |

### Examples

Configuring secondary port for a Smartlink group:

```
switch(config)# smartlink group 3
switch(config-smartlink-3)# secondary-port 1/1/2
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-smartlink-<GROUP>` | Administrators or local user group members with execution rights for this command. |

## control-vlan

```
control-vlan <VLAN-ID>
no control-vlan <VLAN-ID>
```

### Description

Configures control VLAN in a Smartlink group.

The **no** form of this command removes control VLAN from a Smartlink group.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies VLAN ID for a Smartlink group. |

### Usage

- In a Smartlink group, the control VLAN is used to send flush messages.
- Control VLAN is configured on the device intended to send flush messages.
- Each Smartlink group must use a unique control VLAN.
- Control VLAN is protected in the Smartlink group to avoid loops.

### Examples

Configuring control VLAN in a Smartlink group:

```
switch(config)# smartlink group 3
switch(config-smartlink-3)# control-vlan 10
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-smartlink-<GROUP>` | Administrators or local user group members with execution rights for this command. |

## protected-vlans

```
protected-vlans <VLAN-ID-LIST>
no protected-vlans <VLAN-ID-LIST>
```

### Description

Specifies VLANs protected by a Smartlink group.

The **no** form of this command removes VLANs protected by a Smartlink group.

| Parameter | Description |
|---|---|
| *<VLAN-ID-LIST>* | Specifies list of VLAN IDs. Range is 1 to 4094. |

### Examples

Configuring protected VLANs for a Smartlink group.:

```
switch(config)# smartlink group 3
switch(config-smartlink-3)# protected-vlans 1, 10-50
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-smartlink-<GROUP>` | Administrators or local user group members with execution rights for this command. |

# preemption

```
preemption
no preemption
```

## Description

Configures preemption in a Smartlink group.

The **no** form of this command disables preemption in a Smartlink group.

## Usage

- If preemption is enabled, a recovered primary port preempts the active interface after the configured preemption delay.
- If preemption is disabled, a recovered primary port serves as a backup interface and does not forward traffic.

## Examples

Configuring preemption in a Smartlink group:

```
switch(config)# smartlink group 3
switch(config-smartlink-3)# preemption
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-smartlink-<GROUP>` | Administrators or local user group members with execution rights for this command. |

# preemption-delay

```
preemption-delay <SECONDS>
no preemption-delay
```

## Description

Specifies preemption delay for a Smartlink group.

The **no** form of this command removes previously configured preemption delay from a Smartlink group and sets it to the default of 1 second.

| Parameter | Description |
|---|---|
| *<SECONDS>* | Specifies preemption delay in seconds. Range is 0 to 300 seconds. |

### Usage

When preemption is enabled, a recovered primary port always preempts the active interface after the configured preemption delay.

### Examples

Configuring preemption delay on a Smartlink group:

```
switch(config)# smartlink group 3
switch(config-smartlink-3)# preemption
switch(config-smartlink-3)# preemption-delay 10
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config-smartlink-*<GROUP>* | Administrators or local user group members with execution rights for this command. |

# Display commands

## show smartlink group

```
show smartlink group <GROUP-ID>
```

### Description

Shows information for a specific Smartlink group.

| Parameter | Description |
|---|---|
| *<GROUP-ID>* | Specifies Smartlink group ID. |

### Examples

Showing Smartlink group information:

```
switch# show smartlink group 1
Smartlink Group 1 Information:
=============================
Group description         : Uplink1
Protected VLANs           : 20-30
Control VLAN              : 10
Preemption                : ON
Preemption Delay          : 10
Ports  Role      State      Flush Count Last Flush Time
------ --------- ---------- ----------- -------------------------
1/1/1  Primary   Active     2           Sat Oct 17 19:09:10 2020
1/1/2  Secondary Backup     0
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show smartlink group all

```
show smartlink group all
```

## Description

Shows information for all configured Smartlink groups.

## Examples

Showing information for all configured Smartlink groups:

```
switch# show smartlink group all
Smartlink Group Information:
=============================
     Primary Secondary  Active  Backup   Ctrl      Preemption Preemption
Grp  Port    Port       Port    Port     Vlan                 Delay
---- ------- ---------  ------  -------  --------- ---------- ----------
1    1/1/1   1/1/2      1/1/1   1/1/2    10          OFF        1
2    1/1/5   1/1/6      1/1/5   1/1/6    11          OFF        1
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show smartlink group detail

```
show smartlink group detail
```

### Description

Shows detailed information for all configured Smartlink groups.

### Examples

Showing detailed information for all configured Smartlink groups:

```
switch# show smartlink group detail
Smartlink Group 1 Information:
===============================
Protected VLAN                : 1-3
Control VLAN                  : 1
Preemption                    : OFF
Preemption Delay              : 1
Ports    Role         State        Flush Count  Last Flush Time
--------- ------------ ------------ ------------ ------------------------
1/3/1    Primary      Backup       0
1/3/2    Secondary    Active       0

Smartlink Group 2 Information:
===============================
Protected VLAN                : 4-6
Control VLAN                  : 4
Preemption                    : OFF
Preemption Delay              : 1
Ports    Role         State        Flush Count  Last Flush Time
--------- ------------ ------------ ------------ ------------------------
1/3/2    Primary      Active       0
1/3/1    Secondary    Backup       0
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show smartlink flush-statistics

```
show smartlink flush-statistics
```

## Description

Shows information for received flush messages.

## Usage

This command must be executed on an uplink or peer device configured with **recv-control-vlan**.

## Examples

Showing information for received flush messages:

```
switch# show smartlink flush-statistics
Last Flush Packet Detail:
========================

Flush Packets Received                      : 2
Last Flush Packet Received On Interface     : 1/1/1
Last Flush Packet Received On               : Sat Oct 17 19:09:10 2020
Device Id Of Last Flush Packet Received     : 5065f3-127080
Control VLAN Of Last Flush Packet Received  : 10
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## clear smartlink group statistics

```
clear smartlink group [<GROUP-ID>] statistics
```

### Description

Clears Smartlink statistics for the specified Smartlink group or all Smartlink groups.

| Parameter | Description |
|---|---|
| *<GROUP-ID>* | Specifies Smartlink group. |

### Examples

Clearing Smartlink statistics for a specified Smartlink group:

```
switch# clear smartlink group 1 statistics
```

Clearing all Smartlink statistics for all Smartlink groups:

```
switch(config)# clear smartlink group statistics
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## clear smartlink flush-statistics

```
clear smartlink flush-statistics
```

### Description

Clears Smartlink flush statistics.

## Usage

This command must be executed on the uplink device configured with **recv-control-vlan**.

## Examples

Clearing Smartlink flush statistics:

```
switch# clear smartlink flush-statistics
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show running-config

```
show running-config
```

## Description

Shows current running configuration.

## Examples

Showing currently running configuration:

```
switch# configure terminal
switch(config)# smartlink group 1
switch(config-smartlink-1)# description Uplink1
switch(config-smartlink-1)# primary-port 1/1/1
switch(config-smartlink-1)# secondary-port 1/1/2
switch(config-smartlink-1)# control-vlan 10
switch(config-smartlink-1)# protected-vlans 20-30
switch(config-smartlink-1)# preemption
switch(config-smartlink-1)# preemption-delay 10
switch(config)# smartlink group 2
switch(config-smartlink-2)# primary-port 1/1/8
switch(config-smartlink-2)# secondary-port 1/1/9
switch(config-smartlink-2)# control-vlan 11
switch(config-smartlink-2)# protected-vlans 20-30
switch# show running-config
Current configuration:
```

```
!
!
!
smart-link group 1
  primary-port 1/1/1
  secondary-port 1/1/2
  control-vlan 10
  protected-vlans 20-30
  preemption
  preemption-delay 10
  exit
smart-link group 2
  primary-port 1/1/8
  secondary-port 1/1/9
  control-vlan 11
  protected-vlans 20-30
  exit
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# Supportability commands

## show capacities smartlink

```
show capacities smartlink | show capacities-status smartlink
```

### Description

Shows Smartlink capacities or Smartlink capacities and status.

### Examples

Showing Smartlink capacities:

```
switch# show capacities smartlink

System Capacities: Filter SMARTLINK
Capacities Name
```

```
Value
----------------------------------------------------------------------------------
--
Maximum number of SMARTLINK GROUPS configurable in a system
24
```

Showing Smartlink capacities and status:

```
switch# show capacities-status smartlink

System Capacities Status: Filter SMARTLINK
Capacities Status Name                                                Value
Maximum
----------------------------------------------------------------------------------
--
Number of SMARTLINK GROUPS currently configured                           1
24
```

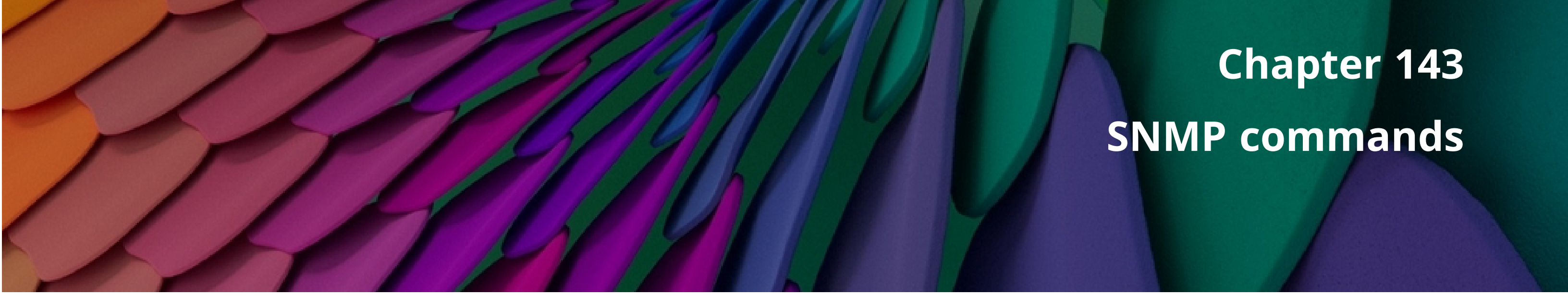
For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |



# Chapter 143

# SNMP commands

## event-trap-enable

```
event-trap-enable
no event-trap-enable
```

### Description

Enables the notification of events to be sent as traps to the SNMP management stations. It is enabled by default.

The **no** form of this command disables the event traps.

### Examples

Enabling the event traps:

```
switch(config)# event-trap-enable
```

Disabling the event traps:

```
switch(config)# no event-trap-enable
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## lldp trap enable

```
lldp trap enable
no lldp trap enable
```

### Description

Enables sending SNMP traps for LLDP related events from a particular interface. LLDP trap generation is enabled by default on all the interfaces and has to be disabled for interfaces on which traps are not required to be generated.

The **no** form of this command disables the LLDP trap generation.

LLDP trap generation is disabled by default at the global level and must be enabled before any LLDP traps are sent.

## Examples

Enabling LLDP trap generation on global level:

```
switch(config)# lldp trap enable
```

Enabling LLDP trap generation on interface level:

```
switch(config-if)# lldp trap enable
```

Disabling LLDP trap generation on global level:

```
switch(config)# no lldp trap enable
```

Disabling LLDP trap generation on interface level:

```
switch(config-if)# no lldp trap enable
```

Displaying LLDP global configuration:

```
switch# show lldp configuration


LLDP Global Configuration
=========================
LLDP Enabled                 : No
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : No


TLVs Advertised
===============
Management Address
Port Description
Port VLAN-ID
System Description
System Name

LLDP Port Configuration
=======================
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
```

```
--------------------------------------------------------------------------
1/1/1          Yes                 Yes                 Yes
1/1/2          Yes                 Yes                 Yes
1/1/3          Yes                 Yes                 Yes
1/1/4          Yes                 Yes                 Yes
1/1/5          Yes                 Yes                 Yes
1/1/6          Yes                 Yes                 Yes
...........
...........
mgmt           Yes                 Yes                 Yes
```

Displaying LLDP Configuration for the interface:

```
switch# show lldp configuration 1/1/1

LLDP Global Configuration
=========================
LLDP Enabled                 : Yes
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : No


LLDP Port Configuration
=======================
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
--------------------------------------------------------------------------
1/1/1          Yes                 Yes                 Yes
```

Displaying LLDP Configuration for the management interface:

```
switch# show lldp configuration mgmt

LLDP Global Configuration
=========================
LLDP Enabled                 : Yes
LLDP Transmit Interval       : 30
LLDP Hold Time Multiplier    : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : Yes


LLDP Port Configuration
=======================
PORT           TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
--------------------------------------------------------------------------
mgmt           Yes                 Yes                 Yes
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` and `config-if` | Administrators or local user group members with execution rights for this command. |

## mac-notify traps

```
mac-notify traps {aged | learned | moved | removed}
no mac-notify traps {aged | learned | moved | removed}
```

### Description

Configures a Layer 2 or VXLAN interface to generate SNMP trap notifications for up to four different types of MAC address related events on the trunk or access in physical or lag interfaces.

MAC notification trap addition to or removal from an interface can be in any combination, quantity, or order. The addition of existing configured traps or removal of non-configured traps will be accepted and ignored.

The **mac-notify** feature must be enabled globally for any interface configurations to generate SNMP traps. Enabling **mac-notify traps** may impact the system performance on networks with a large number of mac-notify events.

The **no** form of this command removes the traps from the interface.

| Parameter | Description |
|---|---|
| `aged` | Notifies when a MAC address aged out on the interface. |
| `learned` | Notifies when a MAC address is learned on the interface. |
| `moved` | Notifies when a MAC address moved from the interface. |
| `removed` | Notifies when a MAC address is removed from the interface. |

MAC notification cannot be configured on a Layer 3 (routing) interface. A Layer 2 interface that is changed to a Layer 3 interface through the `routing` command will discard any existing MAC notification configurations.

When MACs are learned on VXLAN tunnels or **port-access port-security** enabled ports, the move scenario is handled by the EVPN/port-access feature respectively. It performs the move by deleting the MAC from the old port and installing it on the new port. In this scenario, MAC trap notifications, if enabled, will reflect that by producing **removed** and **learned** notifications.

### Usage

- MAC notify trap will not generate for static MACs.
- **vsx-sync** is not supported. You must enable the MAC notify traps explicitly on secondary to ensure the traps are generated.
- For EVPN MAC move between the following interfaces, the respective event types are produced (not always removed or learned)
  - Port to port: **moved**
  - Port to tunnel: **removed/learned**
  - Tunnel to port: **removed/learned**
  - Tunnel to Tunnel: **moved**

### Examples

MAC notification types and the associated events only apply to Layer 2 and VXLAN interfaces, hence routing might need to be disabled on the relevant interfaces.

Enable MAC notification traps within the SNMP module at a global level:

```
switch(config)# snmp-server trap

 aaa-server-reachability-status  Enable SNMP trap for AAA server reachability
status
 configuration-changes           Enable configuration changes traps
 cpu-utilization                 Enable high CPU utilization traps
 link-status                     Enable link status traps for all physical
interfaces
 mac-notify                      Enable MAC table change notification traps
 memory-utilization              Enable high memory utilization traps
 module                          Enable module event traps
 port-security                   Enable port-security violation traps.
                                  (Default: enable)
 rmon-events                     Enable RMON event traps
 snmp                            Enable snmp traps
```

For more information, see snmp-server trap mac-notify.

Enabling the traps on an L2 interface:

```
switch(config)# interface 1/1/1
switch(config-if)# mac-notify traps learned
1/1/1 is not an L2 interface or tunnel
switch(config-if)# no routing
switch(config-if)# mac-notify traps learned removed
switch(config-if)# mac-notify traps moved
switch(config-if)# mac-notify traps aged
```

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# mac-notify traps learned removed
```

```
switch(config)# interface lag101
switch(config-if)# mac-notify traps removed
```

Disabling the `learned` and `removed` traps from the interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no mac-notify traps learned removed
```

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# no mac-notify traps learned removed
```

Enable sending SNMP notifications for MAC table changes:

```
switch(config-vxlan-if)# mac-notify traps
  aged             Notify when a MAC address aged out on the interface
  learned          Notify when a MAC address was learned on the interface
  moved            Notify when a MAC address moved from the interface
  removed          Notify when a MAC address was removed from the interface
switch(config-vxlan-if)# mac-notify traps learned aged removed moved
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13.1000 | Support for SNMP MAC notify traps on VXLAN tunnels. |
| 10.10 | Support for port access features with mac-notify added. |
| 10.08 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command.<br>Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.<br>Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## rmon alarm

```
rmon alarm index <INDEX> snmp-oid <SNMP-OID> rising-threshold <RISING-THRESHOLD>
     falling-threshold <FALLING-THRESHOLD> [sample-interval <SAMPLE-INTERVAL>] [sample-
type <ABSOLUTE|DELTA>]
no rmon alarm [index <INDEX>]
```

### Description

Stores configuration entries in an alarm table that defines the sample interval, sample-type, and threshold parameters for an SNMP MIB object. Only the SNMP MIB objects that resolve to an ASN.1

primitive type of INTEGER (INTEGER, Integer32, Counter32, Counter64, Gauge32, or TimeTicks) will be monitored.

The **no** form of this command removes all RMON alarms and allows you to specify an index to remove a particular RMON alarm.

| Parameter | Description |
|---|---|
| `index <INDEX>` | Specifies the RMON alarm index. Range: 1 to 20. |
| `snmp-oid <SNMP-OID>` | Specifies the SNMP MIB object to be monitored by RMON. |
| `rising-threshold <RISING-THRESHOLD>` | Specifies the upper threshold value for the RMON alarm. |
| `falling-threshold <FALLING-THRESHOLD>` | Specifies the falling threshold value for the RMON alarm. The falling threshold must be less than the rising threshold. |
| `sample-interval  <SAMPLE-INTERVAL>` | Sample interval in seconds. Default: 30. |
| `sample-type <ABSOLUTE\|DELTA>` | Specifies the method of sampling of the SNMP MIB object. Default: Absolute. |

### Examples

Configuring RMON for the MIB object **ifOutErrors.15** with an index **1**, rising threshold of **2147483647** and falling threshold of **-2134** using **absolute** sampling for a sample interval of **100** seconds:

```
switch(config)# rmon alarm index 1 snmp-oid ifOutErrors.15 rising-threshold
2147483647
     falling-threshold -2134 sample-type absolute sample-interval 100
```

Removing RMON alarm with the index 5:

```
switch(config)# no rmon alarm index 5
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# rmon alarm {enable | disable} {index | all}

```
rmon alarm {enable | disable} {index <INDEX> | all}
no rmon alarm [enable | disable] [index <INDEX> | all]
```

## Description

Enables and disables the RMON alarm and its index. RMON alarm is enabled by default.

| Parameter | Description |
|---|---|
| `enable` | Enables the RMON alarm index |
| `disable` | Disables the RMON alarm index. |
| `index <INDEX>` | Specifies the RMON alarm index. Range: 1 to 20. |
| `all` | Specifies all the RMON alarms. |

## Examples

Enabling or disabling all the RMON alarm:

```
switch(config)# rmon alarm enable all
switch(config)# rmon alarm disable all
```

Enabling or disabling RMON alarm by index:

```
switch(config)# rmon alarm enable index 1
switch(config)# rmon alarm disable index 1
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# show configuration-changes trap

```
show configuration-changes trap
```

## Description

Shows the SNMP configuration changes trap settings.

### Example

Showing the SNMP configuration changes trap:

~~~~
switch# show configuration-changes trap


SNMP Configuration changes trap : Enabled
```
~~~~

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show mac-notify

`show mac-notify`

### Description

Displays whether the MAC notification feature in the SNMP module is enabled or not. It also displays the trap notification types configured on the Layer 2 ports in the system.

### Examples

Showing the MAC notification configuration on all configured ports in the system:

```
switch# show mac-notify

MAC notification global setting : Enabled

Port          Enabled Traps
---------------------------------------
1/1/1         aged learned moved
1/1/5         moved
lag101        removed
lag104        aged learned moved removed
...
...
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show mac-notify port

```
show mac-notify [port <PORTS>]
```

### Description

Displays the MAC notification configuration on a range of ports.

| Parameter | Description |
|---|---|
| `[port <PORTS>]` | Specifies a port, range of ports, or list of ports. |

### Examples

Showing the MAC notification configuration on a range of ports:

```
switch(config)# show mac-notify port 1/1/1,1/1/3,1/1/5,lag101-lag104

MAC notification global Setting: Enabled

Port         Enabled Traps
---------------------------------------
1/1/1        aged learned moved
1/1/3        --
1/1/5        moved
lag101       removed
lag102       --
lag103       --
lag104       aged learned moved removed
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show rmon alarm

`show rmon alarm [index <INDEX>]`

### Description

Displays the RMON alarm configurations.

| Parameter | Description |
|---|---|
| `index <INDEX>` | Specifies the RMON alarm index. Range: 1 to 20. |

### Examples

Showing all RMON alarm configurations:

```
switch# show rmon alarm
Index                : 1
Enabled              : true
Status               : valid
MIB object           : ifOutErrors.15
Sample type          : delta
Sampling interval    : 6535 seconds
Rising threshold     : 100
Falling threshold    : 10
Last sampled value   : 0
Last sample time     : 2020-09-21 05:58:11

Index                : 3
Enabled              : true
Status               : invalid
MIB object           : IF-MIB::ifDescr.19
Sample type          : absolute
Sampling interval    : 10000 seconds
Rising threshold     : 4000
Falling threshold    : 10
Last sampled value   : 0
```

Showing RMON alarm with alarm index 1:

```
switch# show rmon alarm index 1
Index                : 1
Enabled              : true
```

```
Status               : valid
MIB object           : ifOutErrors.15
Sample type          : delta
Sampling interval    : 6535 seconds
Rising threshold     : 100
Falling threshold    : 10
Last sampled value   : 0
Last sample time     : 2020-06-21 05:58:11
```

Showing disabled RMON alarm information:

```
switch# show  rmon   alarm
Index                : 1
Enabled              : false
Status               : valid
MIB object           : ifOutErrors.15
Sample type          : delta
Sampling interval    : 6535 seconds
Rising threshold     : 100
Falling threshold    : 10
Last sampled value   : 0
Last sample time     : 2020-09-21 05:58:11

Index                : 3
Enabled              : false
Status               : invalid
MIB object           : IF-MIB::ifDescr.19
Sample type          : absolute
Sampling interval    : 10000 seconds
Rising threshold     : 4000
Falling threshold    : 10
Last sampled value   : 0
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show snmp agent-port

`show snmp agent-port`

### Description

Displays SNMP agent UDP port number.

### Example

Displaying SNMP agent UDP port number:

```
switch# show snmp agent-port
SNMP agent port : 161
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show snmp community

```
show snmp community
```

### Description

Displays a list of all configured SNMPv1/v2c communities.

### Usage

When a user creates a custom community before enabling an SNMP agent, AOS-CX automatically removes the default **public** community from the system.

### Example

Displaying a list of all configured SNMPv1/v2c communities:

```
switch#show snmp community

SNMP-COMMUNITIES

-------------------------------------------------------------------
Community          Access-level  ACL Name   ACL Type   View
-------------------------------------------------------------------
private            ro            my_acl     ipv4       view1
private            ro            my_acl     ipv6       none
private2           rw            new_Acl    ipv6       view2
private3           rw            none       none       none
```

When the switch is configured to use SNMPv3 only, the output of the **show snmp community** command displays the message **SNMP v1/v2c is disabled while snmpv3-only mode is configured**:

```
switch# show snmp community
----------------------------------------------------------------------------------
--------
Community                       Access-level ACL Name                  ACL Type
View
----------------------------------------------------------------------------------
--------
SNMP v1/v2c is disabled while snmpv3-only mode is configured
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | The output of this command now displays an error message when the switch is in SNMPv3-only mode. |
| 10.10 | Output has been updated with SNMP view details. A *View* column is added to the command output. |
| 10.08 | Added *ACL Type* column to the command output. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show snmp system

```
show snmp system
```

### Description

Displays SNMP description, location, and contact information.

### Example

Displaying SNMP description, location, and contact information:

```
switch# show snmp system
SNMP system information
----------------------------
System description : Aggregation router
System location : Main lab
System contact : John Smith, Lab Admin
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show snmp trap

```
show snmp trap
```

### Description

Displays all configured SNMP traps/informs receivers.

### Example

Displaying all configured SNMP trap and informs receivers:

```
switch# show snmp trap
```

```
HOST           PORT  TYPE   VER COMMUNITY/USER NAME VRF        NOTIFICATION TYPES
---------------------------------------------------------------------------------
-
10.10.10.10    162   trap   v1  public              default    bgp
10.10.10.10    162   inform v2c public              default    bgp, ospf, fan,
mstp
10.10.10.10    162   inform v3  name                default
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Updated the example output. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show snmp views

```
show snmp views
```

### Description

Displays the list of all the configured SNMP views.

### Usage

The following table contains the status and its description of the configured SNMP views:

| Status | Description |
|---|---|
| **pending_validation** | Default value that indicates SNMP view is yet to be validated. |
| **operational** | OID and mask validated. |
| **invalid** | Invalid OID/mask. |
| **failed** | Validation failed for reasons other than OID/mask. |

### Examples

Displaying the list of all the configured SNMP views:

```
switch# show snmp views
-------------------------------------------------------
SNMP MIB Views
-------------------------------------------------------
View     : new
OID Tree: sysUpTime.0
Mask     : ff
Type     : included
Status   : pending_validation

View     : admin
OID Tree: ifIndex.1
Mask     : ff:a0
Type     : included
Status   : operational

View     : user
OID Tree: sysb
Mask     : none
Type     : excluded
Status   : invalid

View     : admin
OID Tree: .1.3.6.1.2.1.1
Mask     : none
```

```
Type     : excluded
Status   : operational
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show snmp vrf

```
show snmp vrf
```

### Description

Displays the VRF on which the SNMP agent service is running.

### Example

Displaying SNMP services enabled on VRF:

```
switch#show snmp vrf
SNMP enabled VRF
----------------------------
mgmt
default
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show snmpv3 context

```
show snmpv3 context
```

## Description

Displays all configured SNMP contexts.

## Examples

Displaying all configured SNMP contexts:

```
switch# show snmpv3 context
--------------------------------------------------------------------------
name                            vrf                             community
--------------------------------------------------------------------------
contextA                        default                         private
contextB                        vrf_A                           public
```

```
switch# show snmpv3 context
--------------------------------------------------------------------------
Name           vrf             Community          ype[Instance_id]
------------------------------------------------------------------
A              default         public             vrf
switch#
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show snmpv3 engine-id

```
show snmpv3 engine-id
```

### Description

Displays the configured SNMPv3 snmp engine-id.

If the SNMPv3 engine-id is not configured, by default a unique engine-id is created by the switch using a combination of the enterprise OID value and the switch's mac address.

### Example

Displaying the configured SNMPv3 engine-id:

```
switch# show snmpv3 engine-id
SNMP engine-id : 80:00:B8:5C:08:00:09:1d:de:a5
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show snmpv3 security-level

```
show snmpv3 security-level
```

### Description

Displays the configured SNMPv3 security level.

### Examples

Displaying the configured SNMPv3 security level:

```
switch# show snmpv3 security-level
SNMPv3 security-level : auth
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show snmpv3 users

`show snmpv3 users`

## Description

Displays all configured SNMPv3 users.

For more details on the user enabled status, see **snmpv3 security-level**.

## Example

Displaying all configured SNMPv3 users:

```
switch# show snmpv3 users
------------------------------------------------------------------------
User        AuthMode  PrivMode  Status   Context    Access-level  View
------------------------------------------------------------------------
name        md5       none      Enabled  context2   ro            view1
                                         context1
                                         context3
name2       none      none      Disabled none       ro            view2
name3       none      none      Disabled none       ro            none
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Output has been updated with SNMP view details. A *View* column is added to the command output. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager | Operators or Administrators or local user group members with |

| Platforms | Command context | Authority |
|---|---|---|
|  | (#) | execution rights for this command. Operators can execute this command from the operator context (>) only. |

# snmp-server agent-port

```
snmp-server agent-port <PORT>
no snmp-server agent-port [<PORT>]
```

## Description

Sets the UDP port number that the SNMP master agent uses to communicate. UDP port 161 is the default port.

The **no** form of this command sets the SNMP master agent port to the default value.

| Parameter | Description |
|---|---|
| *<PORT>* | Specifies the UDP port number that the SNMP master agent will use. Range: 1 to 65535. Default: 161. |

## Examples

Setting the SNMP master agent port to **2000**:

```
switch(config)# snmp-server agent-port 2000
```

Resetting the SNMP master agent port to the default value:

```
switch(config-schedule)# no snmp-server agent-port 2000
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |

# snmp-server community

```
snmp-server community <STRING>
```

```
no snmp-server community <STRING>
```

## Description

Adds an SNMPv1/SNMPv2c community string. A community string is like a password that controls read/write access to the SNMP agent. A network management program must supply this name when attempting to get SNMP information from the switch. A maximum of 10 community strings are supported. Once you create your own community string, the default community string (`public`) is deleted.

The **no** form of this command removes the specified SNMPv1/SNMPv2c community string. When no community string exists, a default community string with the value **public** is automatically defined.

| Parameter | Description |
|---|---|
| *<STRING>* | Specifies the SNMPv1/SNMPv2c community string. Range: 1 to 32 printable ASCII characters, excluding space and question mark. |

## Subcommands

```
access-level {ro | rw}
no access-level {ro | rw}
```

This subcommand changes the access level of the SNMP community. The default access level is read-only (**ro**).

The **no** form of this subcommand changes the access level of the community to default.

| Parameter | Description |
|---|---|
| `ro` | Specifies Read-Only access with the SNMP community. |
| `rw` | Specifies Read-Write access with the SNMP community. |

```
access-list {ip | ipv6} <ACL-NAME>
no access-list {ip | ipv6} <ACL-NAME>
```

This subcommand associates an ACL with the SNMP community. If an ACL is not associated with the SNMP community, the default access is allowed for all the hosts.

The **no** form of this subcommand removes association of the ACL with the SNMP community.

| Parameter | Description |
|---|---|
| `ip` | Specifies the IPv4 ACL type. |
| `ipv6` | Specifies the IPv6 ACL type. |
| *<ACL-NAME>* | Specifies the ACL name. It supports a maximum of 64 characters. |

## Examples

Setting the SNMPv1/SNMPv2c community string to **private**:

```
switch(config)# snmp-server community private
```

Removing SNMPv1/SNMPv2c community string **private**:

```
switch(config)# no snmp-server community private
```

Configuring the access level for the SMNP community to read-only:

```
switch(config-community)# access-level ro
```

Changing the access level of the SNMP community to default:

```
switch(config-community)# no access-level rw
```

Associating an IPv4 ACL named **my_acl** with the SMNP community:

```
switch(config-community)# access-list ip my_acl
```

Removing the associated IPv4 ACL named **my_acl** from the SNMP community:

```
switch(config-community)# no access-list ip my_acl
```

The `deny` rule is not supported for SNMP ACL.

Configuration supported for SNMP ACL:

```
access-list ip ipv4_acl
    10 permit any 4.4.4.4 4.4.4.1
    20 permit any 3.3.3.3 3.3.3.1
access-list ipv6 ipv6_acl
    10 permit any 2001::2 2001::1
    20 permit any 3001::2 3001::1
snmp-server vrf default
snmp-server community my_comm_1
    access-list ip ipv4_acl
    access-list ipv6 ipv6_acl
```

Configuration not supported for SNMP ACL:

```
access-list ip ipv4_acl
    10 deny any 6.6.6.6 6.6.6.1
access-list ipv6 ipv6_acl
    10 deny any 6001::6 6000::1
snmp-server vrf default
snmp-server community my_comm_1
    access-list ip ipv4_acl
    access-list ipv6 ipv6_acl
```

**hitcounts** for SNMP ACL will not be incremented.
**Example:show access-list hitcounts ip all** will not show the hit count of SNMP ACL.

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config`<br>`config-community` | Administrators or local user group members with execution rights for this command. |

## snmp-server community view

```
snmp-server community <STRING> [view <VIEW-NAME>]
no snmp-server community <STRING> [view <VIEW-NAME>]
```

### Description

Associates an SNMP MIB view with the SNMP community.

The **no** form of this command removes the associated SNMP MIB view from the SNMP community.

| Parameter | Description |
|---|---|
| *<STRING>* | Specifies the SNMPv1/SNMPv2c community string. Range: 1 to 32 printable ASCII characters, excluding space and question mark. |
| *<VIEW-NAME>* | Specifies the view name for the SNMP MIB view. Accepts a maximum of 32 characters. |

### Examples

Configuring the SNMPv1/SNMPv2c community:

```
switch(config)# snmp-server community my_community
switch(config-community)#
```

Adding SNMP MIB view to the SNMP community:

```
switch(config-community)# view name1
```

Removing SNMP MIB view from the SNMP community:

```
switch(config-community)# no view name1
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config`<br>`config-community` | Administrators or local user group members with execution rights for this command. |

## snmp-server historical-counters-monitor

```
snmp-server historical-counters-monitor
no snmp-server historical-counters-monitor
```

### Description

Enables the Remote Network Monitoring agent (**rmond**) to start collecting historical interface statistics. The **no** form of this command stops the historical interface statistics collection.

### Example

Enabling the `rmond` agent to start historical interface statistics collection:

```
switch(config)# snmp-server historical-counters-monitor
```

Disabling the `rmond` agent to stop historical interface statistics collection:

```
switch(config)# no snmp-server historical-counters-monitor
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# snmp-server response-source

```
snmp-server response-source {interface <IF-NAME> | <IPv4-ADDRESS> | <IPv6-ADDRESS>} [vrf
<VRF-NAME>]
no snmp-server response-source {interface <IF-NAME | <IPv4-ADDRESS> | <IPv6-ADDRESS>}
[vrf <VRF-NAME>]
```

## Description

Configures the source interface or IP address for sending SNMP responses. Each SNMP can independently have its own unique response source IP address.

The **no** form of this command removes the source interface name or IP address for sending SNMP responses.

- It is recommended to use the loopback interface or ip address of the loopback interface as the response source. If a device does not support a loopback interface, then configure SVI interface or SVI IP address as the response source.
- The active gateway IP address cannot be configured as the response source.
- It is recommended to limit the maximum number of response source to five.
- The interface used for the response source should be in the up state. If the interface is down, the default source IP will be used.
- The use of **udp6** is mandatory for IPv6 SNMP operations. For example, you can use the following syntax: **snmpwalk -v2c -c public -m ALL udp6:[2100::2] .1.3.6.1.2.1.1**.

| Parameter | Description |
|---|---|
| `interface <IF-NAME>` | Specifies the source interface name. The interface can be a physical interface, loopback interface, or VLAN interface. |
| `<IPv4-ADDRESS>` | Specifies  the IPv4 address of the source interface for the SNMP response. |
| `<IPv6-ADDRESS>` | Specifies  the IPv6 address of the source interface for the SNMP response. |
| `vrf <VRF-NAME>` | Specifies the VRF name associated to the source interface for the SNMP response. |

## Examples

Configuring a response source for the interface **1/1/12**:

```
switch(config)# snmp-server response-source interface 1/1/12 vrf red
```

Configuring a response source for interface **loopback10**:

```
switch(config)# snmp-server response-source interface loopback10 vrf red
```

Configuring a response source for the IPv4 address **10.0.0.1**:

```
switch(config)# snmp-server response-source 10.0.0.1 vrf sample
```

Configuring a response source for the IPv6 address **2001::1**:

```
switch(config)# snmp-server response-source 2001::1 vrf default
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Added support for IPv6 address. |
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server snmpv3-only

```
snmp-server snmpv3-only
no snmp-server snmpv3-only
```

### Description

Accepts SNMPv3 messages only, SNMPv1 and SNMPv2c will be disabled. By default SNMPv1, SNMPv2c and SNMPv3 will all be enabled.

The **no** form of this command restores the default setting and reenables SNMPv1 and SNMPv2c .

### Examples

Configuring SNMPv3 messages only, and disabling SNMPv1 and SNMPv2c:

```
switch(config)# snmp-server snmpv3-only
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server host

```
snmp-server host <IPv4-ADDR | IPv6-ADDR> trap version <VERSION> [community <STRING>]
[port <UDP-PORT>] [<VRF-NAME>] [notification-type <NOTIFICATION-TYPE>]
no snmp-server host <IPv4-ADDR | IPv6-ADDR> trap version <VERSION> [community <STRING>]
[port <UDP-PORT>] [<VRF-NAME>] [notification-type <NOTIFICATION-TYPE>]

snmp-server host <IPv4-ADDR | IPv6-ADDR> inform version v2c [community <STRING>]
[port <UDP-PORT>] [<VRF-NAME>] [notification-type <NOTIFICATION-TYPE>]
no snmp-server host <IPv4-ADDR | IPv6-ADDR> inform version v2c [community <STRING>]
[port <UDP-PORT>] [<VRF-NAME>] [notification-type <NOTIFICATION-TYPE>]


snmp-server host <IPv4-ADDR | IPv6-ADDR> [trap version v3 | inform version v3] user
<NAME> [port <UDP-PORT>] [<VRF-NAME>] [notification-type <NOTIFICATION-TYPE>]
no snmp-server host <IPv4-ADDR | IPv6-ADDR> [trap version v3 | inform version v3] user
<NAME> [port <UDP-PORT>] [<VRF-NAME>] [notification-type <NOTIFICATION-TYPE>]
```

### Description

Configures a trap/informs receiver to which the SNMP agent can send SNMP v1/v2c/v3 traps or v2c informs. A maximum of 30 SNMP traps/informs receivers can be configured.

The **no** form of this command removes the specified trap/inform receiver.

| Parameter | Description |
|---|---|
| `<IPv4-ADDR>` | Specifies the IP address of a trap receiver in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. You can remove leading zeros. For example, the address **192.169.005.100** becomes **192.168.5.100**. |
| `<IPv6-ADDR>` | Specifies the IP address of a trap receiver in IPv6 format (**x:x::x:x**). |
| `trap version <VERSION>` | Specifies the trap notification type for SNMPv1, v2c or v3. Available options are: **v1**, **v2c** or **v3**. |
| `inform version v2c` | Specifies the inform notification type for SNMPv2c. |
| `trap version v3` | Specifies the trap notification type for SNMPv3. |
| `user <NAME>` | Specifies the SNMPv3 user name to be used in the SNMP trap notifications. |
| `community <STRING>` | Specifies the name of the community string to use when |

| Parameter | Description |
|---|---|
| | sending trap notifications. Range: 1 - 32 printable ASCII characters, excluding space and question mark. Default: **public**. |
| *<UDP-PORT>* | Specifies the UDP port on which notifications are sent. Range: 1 - 65535. Default: 162. |
| *<VRF-NAME>* | Specifies the VRF on which the SNMP agent listens for incoming requests. |
| *<notification-type>* | Specifies the type of notification to be sent to the trap receiver. If no type is specified, all notifications are sent.<br>The supported notification types are:<br>■ aaa-server<br>■ alarm<br>■ bgp<br>■ card<br>■ config<br>■ entity<br>■ fan<br>■ interface<br>■ lldp<br>■ loop-protect<br>■ mac-notify<br>■ mstp<br>■ mvrp<br>■ ospf<br>■ ospfv3<br>■ port-security<br>■ power<br>■ power-ethernet<br>■ rmon<br>■ rpvst<br>■ stp<br>■ temperature<br>■ vrrp<br>■ vsf<br>■ vsx |

## Examples

```
switch(config)# snmp-server host 10.10.10.10 trap version v1
switch(config)# no snmp-server host 10.10.10.10 trap version v1
switch(config)# snmp-server host a:b::c:d trap version v1
switch(config)# no snmp-server host a:b::c:d trap version v1
switch(config)# snmp-server host 10.10.10.10 trap version v2c community public
switch(config)# no snmp-server host 10.10.10.10 trap version v2c community public
switch(config)# snmp-server host a:b::c:d trap version v2c community public
switch(config)# no snmp-server host a:b::c:d trap version v2c community public
switch(config)# snmp-server host 10.10.10.10 trap version v2c community public
port 5000
switch(config)# no snmp-server host 10.10.10.10 trap version v2c community public
port 5000
switch(config)# snmp-server host 10.10.10.10 trap version v2c community public
```

```
port 5000 vrf default
switch(config)# no snmp-server host 10.10.10.10 trap version v2c community public
port 5000 vrf default
switch(config)# snmp-server host a:b::c:d trap version v2c community public port
5000
switch(config)# no snmp-server host a:b::c:d trap version v2c community public
port 5000
switch(config)# snmp-server host 10.10.10.10 inform version v2c community public
switch(config)# no snmp-server host 10.10.10.10 inform version v2c community
public
switch(config)# snmp-server host a:b::c:d inform version v2c community public
switch(config)# no snmp-server host a:b::c:d inform version v2c community public
switch(config)# snmp-server host 10.10.10.10 inform version v2c community public
port 5000
switch(config)# no snmp-server host 10.10.10.10 inform version v2c community
public port 5000
switch(config)# snmp-server host 10.10.10.10 inform version v2c community public
port 5000 vrf default
switch(config)# no snmp-server host 10.10.10.10 inform version v2c community
public port 5000 vrf default
switch(config)# snmp-server host a:b::c:d inform version v2c community public port
5000
switch(config)# no snmp-server host a:b::c:d inform version v2c community public
port 5000
switch(config)# snmp-server host 10.10.10.10 trap version v3 user Admin
switch(config)# no snmp-server host 10.10.10.10 trap version v3 user Admin
switch(config)# snmp-server host a:b::c:d trap version v3 user Admin
switch(config)# no snmp-server host a:b::c:d trap version v3 user Admin
switch(config)# snmp-server host 10.10.10.10 trap version v3 user Admin port 2000
switch(config)# no snmp-server host 10.10.10.10 trap version v3 user Admin port
2000
switch(config)# snmp-server host a:b::c:d trap version v3 user Admin port 2000
switch(config)# no snmp-server host a:b::c:d trap version v3 user Admin port 2000
```

SNMP trap notification type examples:

```
switch(config)# snmp-server host 10.10.10.10 trap version v2c community public
notification-type bgp fan interface power entity
switch(config)# no snmp-server host 10.10.10.10 trap version v2c community public
notification-type bgp
switch(config)# snmp-server host a:b::c:d inform version v3 user Admin
notification-type bgp fan interface power-ethernet
switch(config)# no snmp-server host a:b::c:d inform version v3 user Admin
notification-type bgp interface
switch(config)# snmp-server host a:b::c:d inform version v3 user Admin
notification-type ?
  aaa-server      Sends AAA notifications.
  alarm           Sends Alarm notifications.
  bgp             Sends Border Gateway Protocol (BGP) state change notifications.
  card            Sends Card notifications.
  config          Sends Configuration change notifications.
  entity          Sends Entity notifications.
  fan             Sends Fan notifications.
  interface       Sends Interface notifications.
  lldp            Sends Link Layer Discovery Protocol (LLDP) notifications.
  loop-protect    Sends Loop Protect notifications.
  mac-notify      Sends MAC Notify notifications.
  mstp            Sends Multiple Spanning Tree Protocol (MSTP) notifications.
  mvrp            Sends Multiple VLAN Registration Protocol (MVRP) notifications.
  ospf            Sends Open Shortest Path First (OSPFv2) notifications.
  ospfv3          Sends Open Shortest Path First version 3 (OSPFv3) notifications.
  port-security   Sends Port Security notifications.
  power           Sends Power notifications.
  power-ethernet  Sends Power over Ethernet (PoE) notifications.
  rmon            Sends Remote Network Monitoring (RMON) notifications.
  rpvst           Sends Rapid Per VLAN Spanning Tree (RPVST) notifications.
  snmp            Sends Sends Simple Network Management Protocol (SNMP)
notifications.
  stp             Sends Spanning Tree Protocol (STP) notifications.
  temperature     Sends Temperature notifications.
  vrrp            Sends Virtual Router Redundancy Protocol (VRRP) notifications.
  vsf             Sends Virtual Switching Framework (VSF) notifications.
  vsx             Sends Virtual System Extension (VSX) notifications.
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server system-contact

```
snmp-server system-contact <INFO>
no snmp-server system-contact [<INFO>]
```

### Description

Sets SNMP contact information.

The **no** form of this command removes the SNMP contact information.

| Parameter | Description |
|---|---|
| *<INFO>* | Specifies SNMP contact information. Range: 1 to 128 printable ASCII characters, except for question mark (?). |

### Examples

Defines SNMP contact information to be **John Smith, Lab Admin**:

```
switch(config)# snmp-server system-contact John Smith, Lab Admin
```

Removes SNMP contact information:

```
switch(config)# no snmp-server system-contact
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server system-description

```
snmp-server system-description <DESCRIPTION>
no snmp-server system-description
```

### Description

Sets the SNMP system description.

The **no** form of this command removes the SNMP system description.

| Parameter | Description |
|---|---|
| *<DESCRIPTION>* | Specifies the SNMP system description. Typical content to include would be the full name and version of the following:<br>▪ Hardware type of the system<br>▪ Software operating system<br>▪ Networking software<br>Range: 1 to 64 printable ASCII characters, except for the question mark (?). |

### Examples

Defines the SNMP system description to be **mainSwitch**:

```
switch(config)# snmp-server system-description mainSwitch
```

Removes the SNMP system description:

```
switch(config)# no snmp-server system-description mainSwitch
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server system-location

```
snmp-server system-location <INFO>
no snmp-server system-location
```

### Description

Sets the SNMP location information.

The **no** form of this command removes the SNMP location information.

| Parameter | Description |
|---|---|
| *<INFO>* | Specifies the SNMP location information. Range: 1 to 128 printable ASCII characters, except for the question mark (?). |

### Examples

Defines the SNMP location information to be **Main Lab**:

```
switch(config)# snmp-server system-location Main Lab
```

Removes the SNMP location information:

```
switch(config)# no snmp-server system-location
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmp-server trap

```
snmp-server trap {cpu-utilization | memory-utilization | rmon-events}
no snmp-server trap {cpu-utilization | memory-utilization | rmon-events}
```

## Description

Enables the SNMP traps. The SNMP traps are enabled by default.

The **no** form of this command disables the SNMP traps.

| Parameter | Description |
|---|---|
| `cpu-utilization` | Enables the CPU utilization traps. |
| `memory-utilization` | Enables the memory utilization traps. |
| `rmon-events` | Enables the RMON event traps. |

## Examples

Enabling the SNMP traps:

```
switch(config)# snmp-server trap cpu-utilization
switch(config)# snmp-server trap memory-utilization
switch(config)# snmp-server trap rmon-events
```

Disabling the SNMP traps:

```
switch(config)# no snmp-server trap cpu-utilization
switch(config)# no snmp-server trap memory-utilization
switch(config)# no snmp-server trap rmon-events
```

Displaying the SNMP trap configuration:

```
switch(config)# show running-config all | inc snmp
snmp-server trap rmon-events
snmp-server trap cpu-utilization
snmp-server trap memory-utilization
```

Displaying CPU and Memory usage:

```
switch(config)# show system
Hostname           : XXXX
System Description : XX.10.07.0001CI
System Contact     :
```

```
System Location    :
Vendor             : Aruba
Product Name       : JLXXXX XXXX Base Chassis/3xFT/18xFans/Cbl Mgr/X462 Bundle
Chassis Serial Nbr : SG6ZOO9068
Base MAC Address   : f40343-806400
AOS-CX Version : XX.10.07.0001CI
Time Zone          : UTC
Up Time            : 8 minutes
CPU Util (%)       : 1
Memory Usage (%)   : 10
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server trap aaa-server-reachability-status

```
snmp-server trap aaa-server-reachability-status
no snmp-server trap aaa-server-reachability-status
```

### Description

Enables the SNMP trap for AAA server status. When enabled, traps are sent whenever AAA server (RADIUS, TACACS) status changes from reachable to unreachable and vice versa.

The **no** form of this command disables sending SNMP trap for AAA server status.

### Examples

Enabling the SNMP trap for AAA server status:

```
switch(config)# snmp-server trap aaa-server-reachability-status
```

Disabling the SNMP trap for AAA server status:

```
switch(config)# no snmp-server trap aaa-server-reachability-status
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced on 6200, 6300 and 6400 |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server trap configuration-changes

```
snmp-server trap configuration-changes
no snmp-server trap configuration-changes
```

### Description

Enables sending SNMP traps whenever the configuration changes. Configuration trap generation is disabled by default.

The **no** form of this command disables sending SNMP traps for configuration changes.

| Parameter | Description |
|---|---|
| `configuration-changes` | Specifies SNMP traps for configuration changes. |

### Examples

Enabling the SNMP traps for configuration changes:

```
switch(config)# snmp-server trap configuration-changes
```

Disabling the SNMP traps for configuration changes:

```
switch(config)# no snmp-server trap configuration-changes
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmp-server trap mac-notify

```
snmp-server trap mac-notify
no snmp-server trap mac-notify
```

### Description

Enables the MAC notification traps within the SNMP module at a global level. When enabled, traps are sent for interfaces that are configured for MAC notification events.

The **no** form of this command disables sending MAC notification traps at a global level. When disabled, existing **mac-notify** interface configuration is preserved but MAC notification events on configured interfaces will not cause SNMP traps to be transmitted.

### Examples

Enabling the SNMP MAC notification feature in the system globally:

```
switch(config)# snmp-server trap mac-notify
```

Disabling the SNMP MAC notification feature in the system globally:

```
switch(config)# no snmp-server trap mac-notify
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmp-server trap module

```
snmp-server trap module
no snmp-server trap module
```

### Description

Enables SNMP trap generation for modules. Module trap generation is enabled by default. Generates the module event traps whenever a modular line or fabric card changes state, which includes inserted, removed, ready, and down, as well as when a modular card is unrecognized.

The **no** form of this command disables the SNMP trap generation for module events.

| Parameter | Description |
|---|---|
| `module` | Specifies SNMP traps for module events. |

### Examples

Enabling the SNMP traps for modules:

```
switch(config)# snmp-server trap module
```

Disabling the SNMP traps for modules:

```
switch(config)# no snmp-server trap module
```

```
switch(config)# show running-config
no snmp-server trap module
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server trap port-security

```
snmp-server trap port-security
no snmp-server trap port-security
```

### Description

Enables SNMP port-security violation traps on the system. Port-security violation traps are enabled by default.

The **no** form of this command disables the SNMP port-security violation traps on the system.

| Parameter | Description |
|---|---|
| `port-security` | Specifies SNMP traps for port-security. |

### Examples

Enabling the SNMP port-security violation traps on the system:

```
switch(config)# snmp-server trap port-security
```

Disabling the SNMP port-security violation traps on the system:

```
switch(config)# no snmp-server trap port-security
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server trap snmp

```
snmp-server trap snmp {authentication | coldstart | warmstart} [vrf <VRF_NAME>]
no snmp-server trap snmp {authentication | coldstart | warmstart} [vrf <VRF_NAME>]
```

### Description

Enables SNMPv2 MIB traps. The SNMPv2 traps are disabled by default.

The **no** form of this command disables the SNMPv2 MIB traps.

SNMPv2 MIB supports the following traps:

- `authentication`: Authentication trap is sent when the SNMP server receives a protocol message that is not properly authenticated.
- `coldstart`: A coldstart trap is sent when the switch reboots.
- `warmstart`: A warmstart trap is sent when there is a user intervention to enable or disable the SNMP service on the switch.

SNMPv2 Authentication traps do not support source IP configuration.

| Parameter | Description |
|---|---|
| `authentication` | Enables the authentication traps. |
| `coldstart` | Enables the coldstart traps. |
| `warmstart` | Enables the warmstart traps. |
| *<VRF_NAME>* | Specifies the VRF name. Enables the SNMPv2 traps for a VRF. |

### Examples

Enabling all SNMPv2 traps:

```
switch(config)# snmp-server trap snmp
```

Enabling only SNMPv2 authentication traps:

```
switch(config)# snmp-server trap snmp authentication
```

Disabling all SNMP traps:

```
switch(config)# no snmp-server trap snmp
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server trap-source interface vrf

```
snmp-server trap-source {interface <IF-NAME> | <IPv4-Address> | <IPv6-Address>} [vrf
<VRF-NAME>]
no snmp-server trap-source {interface <IF-NAME> | <IPv4-Address> | <IPv6-Address>} [vrf
<VRF-NAME>]
```

### Description

Configures SNMP trap source interface or IP address for a VRF.

The **no** form of this command removes the SNMP **trap-source** configuration for a VRF.

| Parameter | Description |
|---|---|
| *<IF-NAME>* | Specifies the source interface name. Interface name can be physical interface, loopback interface, LAG interface, or VLAN interface. |
| *<IPv4-Address>* | Specifies the IPv4 address of source interface for the SNMP trap. |
| *<IPv6-Address>* | Specifies the IPv6 address of source interface for the SNMP trap. |
| *<VRF-NAME>* | Specifies the name of a VRF associated to the source interface for the SNMP trap. |

### Examples

Configuring SNMP trap source interface for a VRF.

```
switch(config)# snmp-server trap-source interface 1/1/12 vrf sample
switch(config)# snmp-server trap-source interface loopback10 vrf sample
switch(config)# snmp-server trap-source interface vlan23 vrf sample
```

Configuring SNMP trap source IP address for a VRF.

```
switch(config)# snmp-server trap-source 10.0.0.1 vrf red
switch(config)# snmp-server trap-source 1001::1 vrf red
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server trap vsx

```
snmp-server trap vsx
no snmp-server trap vsx
```

### Description

Enables sending the SNMP traps for VSX related events. VSX trap generation is disabled by default.

The **no** form of this command disables sending the SNMP traps for VSX related events.

The trap support is available for the following VSX events:

- ISL up and down
- KA up and down
- MCLAG up and down

| Parameter | Description |
|---|---|
| `vsx` | Specifies SNMP traps for VSX events. |

### Examples

Enabling the VSX traps:

```
switch(config)# snmp-server trap vsx
```

```
switch(config)# show vsx configuration trap
SNMP traps : Enabled
```

Disabling the VSX traps:

```
switch(config)# no snmp-server trap vsx
```

```
switch(config)# show vsx configuration trap
SNMP traps : Disabled
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmp-server view

```
snmp-server view <VIEWNAME> <OID_TREE> [<MASK>] <included/excluded>
no snmp-server view <VIEWNAME> <OID_TREE> [<MASK>] <included/excluded>
```

### Description

Configures an SNMP MIB view.

The **no** form of this command removes the specified SNMP MIB view.

| Parameter | Description |
|---|---|
| *<VIEWNAME>* | Specifies the name of the SNMP MIB view. Supports up to a maximum of 32 characters. |
| *<OID_TREE>* | Specifies the OID tree to be included or excluded in SNMP MIB view. |
| *<MASK>* | Specifies the OID mask value. The values must be in hexadecimal character separated with : (colon). |
| *<included/excluded>* | Specifies the OID tree that is included in or excluded from the SNMP MIB view. |

## Usage

You can configure a maximum of 50 SNMP MIB views. The following VTY message is displayed when the configuration exceeds the maximum SNMP MIB views:

```
switch(config)# snmp-server view name51 1.3.6.1.2.1.1 fe:00 included
Configuration failed: Maximum allowed views are configured.
```

## Examples

Configuring the SNMP MIB views:

```
switch(config)# snmp-server view name1 .1.3.6.1.2.1.2.2.1.1.1 FF:A0 included
switch(config)# snmp-server view name2 IF-MIB::ifindex included
switch(config)# snmp-server view name4 1.3.6.1.2.1.1 fe:00 included
```

Removing an SNMP MIB view:

```
switch(config)# no snmp-server view name4 1.3.6.1.2.1.1 fe:00 included
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmp-server vrf

```
snmp-server vrf <VRF-NAME>
no snmp-server vrf <VRF-NAME>
```

## Description

Configures a VRF on which the SNMP agent listens for incoming requests. By default, the SNMP agent does not listen on any VRF. 4100i, 6000, and 6100 only support default VRF. **The SNMP agent can listen on multiple VRFs.**

The **no** form of this command stops the SNMP agent from listening for incoming requests on the specified VRF.

| Parameter | Description |
|---|---|
| *<VRF-NAME>* | Specifies the name of a VRF. |

## Examples

Configuring the SNMP agent to listen on VRF **default**.

```
switch(config)# snmp-server vrf default
```

Configuring the SNMP agent to listen on VRF **mgmt**.

```
switch(config)# snmp-server vrf mgmt
```

Configuring the SNMP agent to listen on used-defined VRF **myvrf**.

```
switch(config)# snmp-server vrf myvrf
```

Stopping the SNMP agent from listening on VRF **default**.

```
switch(config)# no snmp-server vrf default
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmpv3 context

```
snmpv3 context <NAME> vrf <VRF-NAME> [community <STRING>]
no snmpv3 context <NAME> [vrf <VRF-NAME>] [community <STRING>]
```

## Description

Creates an SNMPv3 context on the specified VRF.

The **no** form of this command removes the specified SNMP context.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies the name of the context. Range: 1 to 32 printable ASCII characters, excluding space and question mark (?). |
| `vrf <VRF-NAME>` | Specifies the VRF associated with the context. Default: default. |
| `community <STRING>` | Specifies the SNMP community string associated with the context. Range: 1 to 32 printable ASCII characters, excluding space and question mark. Default: public. |

## Examples

Creating an SNMPv3 context named **newContext**:

```
switch(config)# snmpv3 context newContext
```

Creating an SNMPv3 context named **newContext** on VRF **myVrf** and with community string **private**.

```
switch(config)# snmpv3 context newContext vrf myVrf community private
```

Removing the SNMPv3 context named **newContext** on VRF **myVrf**:

```
switch(config)# no snmpv3 context newContext vrf myVrf
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmpv3 engine-id

```
snmpv3 engine-id <ENGINE-ID>
no snmpv3 engine-id <ENGINE-ID>
```

## Description

Configures the SNMPv3 SNMP engine-id allowing an administrator to configure a unique SNMP engine-id for the switch. This engine-id is used by the NMS management tool to identify and distinguish multiple switches on the same network.

The **no** form of this command restores the default engine-id, created by the switch using a combination of the enterprise OID value and the switch's mac address.

| Parameter | Description |
|---|---|
| *<ENGINE-ID>* | SNMPv3 SNMP engine-id in colon separated hexadecimal notation. |

## Examples

Configuring the SNMPv3 engine-id:

```
switch(config)#
switch(config)# snmpv3 engine-id
  WORD  SNMPv3 snmp engine-id in colon seperated hexadecimal notation
switch(config)# snmpv3 engine-id 01:23:45:67:89:ab:cd:ef:01:23:45:67
```

Restoring the default SNMPv3 engine-id:

```
switch(config)# no snmpv3 engine-id
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmpv3 security-level

```
snmpv3 security-level {auth | auth-privacy}
no snmpv3 security-level {auth | auth-privacy}
```

## Description

Configures the SNMPv3 security level. The security level determines which SMNPv3 users defined by the command `snmpv3 user` are able to connect.

The **no** form of this command changes the security level as follows:

- **no snmpv3 security-level auth**: Sets the security level to **auth-privacy**.
- **no snmpv3 security-level auth-privacy**: Sets the security level to no authentication or privacy, allowing any SNMP user to connect.

| Parameter | Description |
|---|---|
| `auth` | SNMPv3 users that support authentication, or authentication and privacy are allowed. |
| `auth-privacy` | Only SNMPv3 users with both authentication and privacy are allowed. This is the highest level of SNMPv3 security. Default. |

## Examples

Setting the SNMPv3 security level to authentication and privacy:

```
switch(config)# snmpv3 security-level auth-privacy
```

Setting the SNMPv3 security level to authentication only:

```
switch(config)# snmpv3 security-level auth
```

Setting the SNMPv3 security level to no authentication and no privacy:

```
switch(config)# no snmpv3 security-level auth-privacy
```

Restoring the default SNMPv3 security level to authentication and privacy:

```
switch(config)# no snmpv3 security-level auth
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# snmpv3 user

```
snmpv3 user <NAME>
      [auth <AUTH-PROTO> auth-pass [{plaintext | ciphertext} <AUTH-PASS>]]
      [priv <PRIV-PROTO> priv-pass [{plaintext | ciphertext} <PRIV-PASS>]]
      [access-level ro|rw]

no snmpv3 user <NAME>
        [auth <AUTH-PROTO> auth-pass [{plaintext | ciphertext} <AUTH-PASS>]]
        [priv <PRIV-PROTO> priv-pass [{plaintext | ciphertext} <PRIV-PASS>]]
        [access-level ro|rw]
```

## Description

Creates an SNMPv3 user and adds it to an SNMPv3 context. The SNMPv3 security level (set with command **snmpv3 security-level**) determines which users are allowed to authenticate.

The **no** form of this command removes the specified SNMPv3 user.

When updating the authentication protocols and privacy protocols for the existing SNMPv3 users, you must also update the access level. Otherwise, the access level will be set to read-only.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies the SNMPv3 username. Range 1 to 32 printable ASCII characters, excluding space and question mark (?). |
| access-level | Configures the access level for the SNMPv3 user:<br>■ **ro**: Allow read-only access for the SNMPv3 user<br>■ **rw**: Allow read-write access for the SNMPv3 user |
| `auth <AUTH-PROTO>` | Sets the authentication protocol used to validate user logins. Supported protocols are **md5**, **sha**, **sha224**, **sha256**, **sha384**, and **sha512**. |
| `auth-pass [{plaintext \| ciphertext} <AUTH-PASS>]` | Specifies the SNMPv3 user authentication password. Range for **plaintext** is 8 to 32 printable ASCII characters, excluding space and question mark (?). Range for **ciphertext** is 1 to 256 printable ASCII characters. Ciphertext is used when copying user configuration settings between switches.<br>**NOTE:** Authentication passwords that include special characters must be enclosed |

| Parameter | Description |
|---|---|
|  | in single quotation marks ('). For example, **'auth-pwd20246!@#'**. |
| `priv <PRIV-PROTO>` | Sets the SNMPv3 privacy protocol (encryption method). Supported privacy protocols are **aes**, **aes192**, **aes256**, and **des**. |
| `priv-pass [{plaintext \| ciphertext} <PRIV-PASS>]` | Specifies the SNMPv3 user privacy encryption password. Range for **plaintext** is 8 to 32 printable ASCII characters, excluding space and question mark (?). Range for **ciphertext** is 1 to 256 printable ASCII characters. Ciphertext is used when copying user configuration settings between switches.<br>**NOTE:** Authentication passwords that include special characters must be enclosed in single quotation marks ('). For example, **'priv-pwd20246!@#'**. |

When the authentication password is not provided on the command line, plaintext authentication password prompting occurs upon pressing Enter, followed by privacy encryption protocol prompting, and finally plaintext encryption password prompting. The entered password characters are masked with asterisks.

When the authentication type and password plus the privacy protocol (encryption method) are provided on the command line but the encryption password is not provided, plaintext encryption password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

## Examples

Defining SNMPv3 user **Admin1** using **sha** authentication and **des** privacy encryption with provided plaintext passwords:

```
switch(config)# snmpv3 user Admin1 auth sha auth-pass plaintext F82#450h
                priv des priv-pass plaintext F82#4eva
```

Defining SNMPv3 user **Admin2** using **MD5** authentication and **AES** privacy encryption with provided authentication password and privacy encryption type but prompted encryption password:

```
switch(config)# snmpv3 user Admin2 auth md5 auth-pass plaintext F82#450h
                priv aes priv-pass
Enter the privacy encryption key: ********
Re-Enter the privacy encryption key: ********
```

Defining SNMPv3 user **Admin2** using **MD5** authentication and **AES** privacy encryption with plaintext password prompting and privacy encryption selection:

```
switch(config)# snmpv3 user Admin2 auth md5 auth-pass
Enter the authentication password: ********
Re-Enter the authentication password: ********

Configure the privacy protocol (y/n)? y
Enter the privacy protocol (aes/des)? aes

Enter the privacy encryption key: ********
Re-Enter the privacy encryption key: ********
```

Removing SNMPv3 user **Admin1**:

```
switch(config)# no snmpv3 user Admin1
```

Creating an SNMP user on switch 1 and then creating the same user on switch 2 by copying from the switch 1 configuration:

On switch 1, configure a user named **Admin3**, and then use the **show running-config** command to display switch configuration. Save a copy of the full **snmpv3 user** command (shown by **show running-config**). This saved command is used on switch 2.

```
switch1(config)# snmpv3 user Admin3 auth sha auth-pass plaintext F82#450h
                 priv des priv-pass plaintext F82#4eva
switch1(config)# exit
switch1# show running-config
Current configuration:
!
!Version AOS-CX xx.xx.xx.xxxxxx
!
snmpv3 user Admin3 auth sha auth-pass ciphertext AQBaf2d...FJVcZ3o=
priv des priv-pass ciphertext AQBaH2p...2jfTFwQ=
ssh server vrf mgmt
!
interface mgmt
    no shutdown
    ip dhcp
vlan 1
```

On switch 2, execute the **snmpv3 user** command that you saved from switch 1 (as shown by **show running-config**). This creates the user on switch 2 with the same configuration.

```
switch2(config)# snmpv3 user Admin3 auth sha auth-pass ciphertext
AQBaf2d...FJVcZ3o=
                 priv des priv-pass ciphertext AQBaH2p...2jfTFwQ=
```

The following command sets a read-write access level for an SNMPv3 user with the user name **user1**.

```
switch(config)# snmpv3 user user1 auth md5 auth-pass plaintext abc1234 access-
level rw
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.13 | Following authentication protocols are supported: **sha224**, **sha256**, **sha384**, and **sha512**.<br>Following privacy protocols are supported: **aes192** and **aes256**. |
| 10.09 | The **access-level** parameter was introduced. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## snmpv3 user view

```
snmpv3 user <USER-NAME> view <VIEW-NAME>
no snmpv3 user <USER-NAME> view <VIEW-NAME>
```

### Description

Associates a user with an existing SNMP MIB view.

The **no** form of this command removes the associated user from the specified SNMP MIB view.

| Parameter | Description |
|---|---|
| *<USER-NAME>* | Specifies the user name for the SNMP MIB view. Accepts a maximum of 32 characters. |
| *<VIEWNAME>* | Specifies the view name for the SNMP MIB view. Accepts a maximum of 32 characters. |

### Examples

Adding a user in the existing SNMP MIB view:

```
switch(config)# snmpv3 user nw-admin view my-nw-view
```

Removing the user from the SNMP MIB view:

```
switch(config)# no snmpv3 user nw-admin view my-nw-view
```

Attaching unconfigured or unknown SNMP view to an SNMPv3 user:

```
switch(config)# snmpv3 user nw-admin view myView
View myView is not configured.
```

For more information on features that use this command, refer to the SNMP/MIB Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# Chapter 144

# Source-interface selection commands

## ip source-interface

```
ip source-interface <PROTOCOL> {<IP-ADDR>|interface <IFNAME>} [vrf <VRF-NAME>]
no ip source-interface <PROTOCOL> interface <IFNAME> [vrf <VRF-NAME>]
```

### Description

Configures the IPv4 source-interface interface to use for the specified protocol. If a VRF is not given, the default VRF applies.

The **no** form of this command removes the specified configuration.

| Parameter | Description |
|---|---|
| *<PROTOCOL>* | Specifies the protocol to configure.<br>`all`<br>Selects the source for all protocols covered by this command.<br>`central`<br>Selects Aruba Central.<br>`dhcp_relay`<br>Selects DHCP relay. When you configure a dhcp_relay source interface, you must also enable DHCP relay Option 82 using the **dhcp-relay option 82 source-interface** command.<br>`dns`<br>Selects DNS.<br>`http`<br>Selects HTTP.<br>`ipfix`<br>Selects ipfix. Configures source interface for IPFIX.<br>`ntp`<br>Selects NTP.<br>`ptp`<br>Selects PTP.<br>`radius`<br>Selects RADIUS.<br>`sflow`<br>Selects sFLow.<br>`sftp-scp`<br>Selects SFTP and SCP.<br>`ssh-client`<br>Selects SSH Client.<br>`syslog` |

| Parameter | Description |
|---|---|
| | Selects the source for syslog packets.<br>tacacs<br>Selects the source for TACACS packets.<br>tftp<br>Selects TFTP.<br>ubt<br>Selects UBT. |
| | Specifies the VRF name. |
| *<IFNAME>* | Specifies the interface name. |
| *<IP-ADDR>* | Specifies the IPv4 address. |
| vrf *<VRF-NAME>* | Specifies the VRF name. |

## Examples

Configuring IPv4 source-interface interface 1/1/1 to use for the TFTP protocol:

```
switch(config)# ip source-interface tftp interface 1/1/1
```

Configuring IPv4 source-interface interface 1/1/2 to use for the TFTP protocol on VRF green :

```
switch(config)# ip source-interface tftp interface 1/1/2 vrf green
```

Removing IPv4 source-interface 1/1/1configuration for the TFTP protocol:

```
switch(config)# no ip source-interface tftp interface 1/1/1
```

Removing source-interface interface 1/1/2 configuration for TFTP protocol on VRF green:

```
switch(config)# no ip source-interface tftp interface 1/1/2 vrf green
```

Configuring source-interface IPv4 10.1.1.1 to use for the TFTP protocol:

```
switch(config)# ip source-interface tftp 10.1.1.1
```

Configuring source-interface IPv4 10.1.1.2 to use for the TFTP protocol on VRF green :

```
switch(config)# ip source-interface tftp 10.1.1.2 vrf green
```

Removing source-interface IPv4 10.1.1.1 configuration for the TFTP protocol:

```
switch(config)# no ip source-interface tftp 10.1.1.1
```

Removing source-interface IPv4 10.1.1.2 configuration for TFTP protocol on VRF green:

```
switch(config)# no ip source-interface tftp 10.1.1.2 vrf green
```

Configuring source-interface IPv4 10.1.1.1 to use for the DNS protocol:

```
switch(config)# ip source-interface dns 10.1.1.1
```

Configuring source-interface IPv4 10.1.1.2 to use for the DNS protocl on VRF green :

```
switch(config)# ip source-interface dns 10.1.1.2 vrf green
```

Removing source-interface IPv4 10.1.1.1configuration for the DNS protocol:

```
switch(config)# no ip source-interface tftp 10.1.1.1
```

Removing source-interface IPv4 10.1.1.2 configuration for the DNS protocol on VRF green:

```
switch(config)# no ip source-interface dns 10.1.1.2 vrf green
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12.1000 | Added `cental`, `sftp-scp`, and `ssh-client` parameters. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ipv6 source-interface

```
ipv6 source-interface <PROTOCOL> {<IPV6-ADDR>|interface <IFNAME>} [vrf <VRF-NAME>]
no ipv6 source-interface <PROTOCOL> {<IPV6-ADDR>|interface <IFNAME>} [vrf <VRF-NAME>]
```

### Description

Configures the IPv6 source-interface interface to use for the specified protocol. If a VRF is not given, the default VRF applies.

The **no** form of this command removes all configurations.

| Parameter | Description |
|---|---|
| *<PROTOCOL>* | Specifies the protocol to configure.<br>`all`<br>Selects all protocols supported by this command.<br>`central`<br>Selects Aruba Central.<br>`dhcp_relay`<br>Selects DHCP relay.<br>`dns`<br>Selects DNS packets<br>`http`<br>Selects HTTP.<br>`ntp`<br>Selects NTP.<br>`radius`<br>Selects radius.<br>`sftp-scp`<br>Selects SFTP and SCP.<br>`sflow`<br>Selects sFLow.<br>`ssh-client`<br>Selects SSH Client.<br>`syslog`<br>Selects syslog.<br>`tacacs`<br>Selects TACACS.<br>`tftp`<br>SelectsTFTP.<br>`ipfix`<br>Selects ipfix. Configures source interface for IPFIX. |
| *<IPV6-ADDR>* | Specifies the IPv6 address. |
| *<IFNAME>* | Specifies the interface name. |
| `vrf` *<VRF-NAME>* | Specifies the VRF name. |

## Examples

Configuring IPv6 source-interface interface 1/1/1 to use for the TFTP protocol :

```
switch(config)# ipv6 source-interface tftp interface 1/1/1
```

Configuring IPv6 source-interface interface 1/1/2 to use for the TFTP protocol on VRF green :

```
switch(config)# ipv6 source-interface tftp interface 1/1/2 vrf green
```

Removing IPv6 source-interface interface 1/1/1 configuration for the TFTP protocol:

```
switch(config)# no ipv6 source-interface tftp interface 1/1/1
```

Removing IPv6 source-interface interface 1/1/2 configuration for the TFTP protocol on VRF green:

```
switch(config)# no ipv6 source-interface tftp interface 1/1/2 vrf green
```

Configuring source-interface IPv6 1111:2222 to use for the TFTP protocol:

```
switch(config)# ipv6 source-interface tftp 1111:2222
```

Configuring source-interface IPv6 1111:3333 to use for TFTP protocol on VRF green :

```
switch(config)# ipv6 source-interface tftp 1111:3333 vrf green
```

Removing source-interface IPv6 1111:2222 configuration for TFTP protocol:

```
switch(config)# no ipv6 source-interface tftp 1111:2222
```

Removing source-interface IPv6 1111:3333 configuration for TFTP protocol on VRF green:

```
switch(config)# no ipv6 source-interface tftp 1111:3333 vrf green
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13.0001 | Added the **dns** protocol parameter. |
| 10.12.1000 | Added **central, sftp-scp, dhcp_relay** and **ssh-client** parameters. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# ipv6 source-interface dns

```
ipv6 source-interface {dns | all} {interface | X:X::X:X} [vrf <VRF-NAME>]
[no] ipv6 source-interface {dns | all} {interface | X:X::X:X} [vrf <VRF-NAME>]
```

## Description

Configures the IPv6 source-interface or source IP for IPv6 DNS clients.

The **no** form of this command removes all configurations.

| Parameter | Description |
|---|---|
| *<PROTOCOL>* | Specifies the protocol to configure.<br>`all`<br>Selects all protocols supported by this command.<br>`central`<br>Selects Aruba Central.<br>`dhcp_relay`<br>Selects DHCP relay.<br>`dns`<br>Selects DNS packet source.<br>`http`<br>Selects HTTP.<br>`ntp`<br>Selects NTP.<br>`radius`<br>Selects radius.<br>`sftp-scp`<br>Selects SFTP and SCP.<br>`sflow`<br>Selects sFLow.<br>`ssh-client`<br>Selects SSH Client.<br>`syslog`<br>Selects syslog.<br>`tacacs`<br>Selects TACACS.<br>`tftp`<br>SelectsTFTP.<br>`ubt`<br>SelectsUBT. |
| *<IPV6-ADDR>* | Specifies the IPv6 address. |
| `vrf` *<VRF-NAME>* | Specifies the VRF name. |

## Examples

Configuring IPv6 source-interface dns :

```
switch(config)# ipv6 source-interface
        all         All protocols
        central     Aruba Central protocol
        dhcp_relay  DHCP_RELAY protocol
        dns         DNS protocol
        http        HTTP protocol
        ntp         NTP protocol
        radius      RADIUS protocol
        sflow       sFlow protocol
        sftp-scp    SFTP and SCP protocols
        ssh-client  SSH Client protocol
        syslog      syslog protocol
        tacacs      TACACS protocol
        tftp        TFTP protocol
```

Configuring IPv6 source -interface dns:

```
switch(config)# ipv6 source-interface dns
X:X::X:X   Specify an IPv6 address
interface  Interface information
```

Configuring IPv6 source-interface dns on 1: :1:

```
switch(config)# ipv6 source-interface dns 1::1
vrf   VRF Configuration
<cr>
```

Configuring IPv6 source-interface dns on 1: :1: vrf:

```
switch(config)#  ipv6 source-interface dns 1::1 vrf
VRF_NAME  VRF name
```

Configuring IPv6 source-interface dns on 1: :1 vrf BLUE

```
switch(config)# ipv6 source-interface dns 1::1 vrf BLUE
switch(config)# ipv6 source-interface dns interface vlan10
vrf   VRF Configuration
<cr>
```

Configuring IPv6 source-interface dns on vlan10 vrf BLUE:

```
switch(config)# ipv6 source-interface dns interface vlan10 vrf BLUE
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.13 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# show ip source-interface

```
show ip source-interface <PROTOCOL> [vrf <VRF-NAME> | all-vrfs]
```

## Description

Displays the source interface information for all VRFs or a specific VRF.

If a VRF is not specified, the default is displayed.

| Parameter | Description |
|---|---|
| *<PROTOCOL>* | Specifies the protocol to show.<br>`all`<br>Shows the source interface configuration for all other protocols.<br>`central`<br>Shows the source interface configuration for Aruba Central.<br>`dhcp relay`<br>Shows the source interface configuration for DHCP relay.<br>`dns`<br>Shows the source interface configuration for DNS.<br>`ipfix`<br>Selects ipfix. Configures source interface for IPFIX.<br>`http`<br>Shows the source interface configuration for HTTP.<br>`ntp`<br>Shows the source interface configuration for NTP.<br>`ptp`<br>Shows the source interface configuration for PTP.<br>`radius`<br>Shows the source interface configuration for radius.<br>`sflow`<br>Shows the source interface configuration for sFLow.<br>`sftp-scp`<br>Shows source interface configuration for SFTP and SCP.<br>`ssh-client`<br>Shows source interface configuration for SSH Client.<br>`syslog`<br>Shows the source interface configuration for syslog.<br>`tacacs`<br>Shows the source interface configuration for TACACS.<br>`tftp`<br>Shows the source interface configuration for TFTP. |

| Parameter | Description |
|---|---|
|  | `ubt`<br>Shows the source interface configuration for PTP. |
| `vrf` *`<VRF-NAME>`* | Specifies the VRF name. |
| *`all-vrfs`* | Shows the source interface configuration for all VRFs. |

## Examples

Displaying all source-interface protocol configurations for VRF red:

```
switch# show ip source-interface all vrf red
Source-interface Configuration Information
----------------------------------------------------------------
Protocol        Src-Interface        Src-IP                 VRF
----------------------------------------------------------------
all             1/1/1                                       red
switch#
```

Displaying all source-interface protocol configurations for default VRF:

```
switch# show ip source-interface all
Source-interface Configuration Information
--------------------------------------------------------------------
Protocol        Src-Interface        Src-IP                 VRF
--------------------------------------------------------------------
all                                  1.1.1.1                default
switch#
```

Displaying all source-interface protocol configurations for all VRFs:

```
switch# show ip source-interface all all-vrfs
Source-interface Configuration Information
--------------------------------------------------------------------
Protocol        Src-Interface        Src-IP                 VRF
--------------------------------------------------------------------
all                                  2.2.2.2                all-vrfs
all                                  1.1.1.1                default
all              1/1/1/1                                    red
switch#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.12.1000 | Added `central`, `sftp-scp`, and `ssh-client` parameters. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show ipv6 source-interface

`show ipv6 source-interface <PROTOCOL> [detail] [vrf <VRF-NAME> | all-vrfs]`

### Description

Displays the IPV6 source interface information configured in the router for all VRFs or a specific VRF.

If a VRF is not specified, the default is displayed.

| Parameter | Description |
|---|---|
| *<PROTOCOL>* | Specifies the protocol to show.<br>`all`<br>Shows the source interface configuration for all other protocols.<br>`central`<br>Shows the source interface configuration for Aruba Central.<br>`dhcp_relay`<br>Shows the source interface configuration for DHCP realy.<br>`dns`<br>Shows the source interface configuration for DNS.<br>`http`<br>Shows the source interface configuration for HTTP.<br>`ntp`<br>Shows the source interface configuration for NTP.<br>`radius`<br>Shows the source interface configuration for radius.<br>`sflow`<br>Shows the source interface configuration for sFLow.<br>`sftp-scp`<br>Shows source interface configuration for SFTP and SCP.<br>`ssh-client`<br>Shows source interface configuration for SSH Client.<br>`ipfix`<br>Selects ipfix. Configures source interface for IPFIX.<br>`syslog`<br>Shows the source interface configuration for syslog.<br>`tacacs`<br>Shows the source interface configuration for TACACS.<br>`tftp`<br>Shows the source interface configuration for TFTP. |

| Parameter | Description |
|---|---|
| vrf *<VRF-NAME>* | Specifies the VRF name. |
| *all-vrfs* | Shows the source interface configuration for all VRF. |

### Examples

Displaying all IPv6 source-interface protocol configurations for default VRF:

```
switch# show ipv6 source-interface all
Source-interface Configuration Information
------------------------------------------------------------------
Protocol        Src-Interface       Src-IP                 VRF
------------------------------------------------------------------
all                                 1111::2222              default
switch#
```

Displaying all IPv6 source-interface protocol configuration for VRF red:

```
switch# show ipv6 source-interface all vrf red
Source-interface Configuration Information
---------------------------------------------------------------
Protocol        Src-Interface       Src-IP                 VRF
---------------------------------------------------------------
all             1/1/1              2005::2                        red
switch#
```

Displaying all IPv6 source-interface protocol configurations for all VRFs:

```
switch# show ipv6 source-interface all all-vrfs
Source-interface Configuration Information
-------------------------------------------------------------------
Protocol        Src-Interface       Src-IP                VRF
-------------------------------------------------------------------
all                                2222::3333           all-vrfs
all                                1111::2222           default
all             1/1/1              2::2                 red
```

Displaying all IPv6 source-interface protocol confirgurations for dns all VRFs:

```
switch# show ipv6 source-interface dns all-vrfs
Source-interface Configuration Information
----------------------------------------------------------------------------------
--
Protocol        Src-Interface       Src-IP                  VRF
----------------------------------------------------------------------------------
--
dns                                 1::3                    blue
dns                                 1::4                    default
dns                                 1::2                    red
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Added `dns` parameters. |
| 10.12.1000 | Added `central`, `sftp-scp`, and `ssh-client` parameters. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show running-config

`show running-config`

### Description

Displays the current running configuration.

### Examples

Displaying the running configuration (only items of interest to source interface selection are shown in this example output command):

Aruba Central is the priority agent. If no command is specified for ip source-interface, Central will choose the command automatically if it is reachable on any of the known ports.

```
switch# show running-config
vrf green
ip source-interface tftp interface 1/1/2 vrf green
ip source-interface radius interface 1/1/2 vrf green
ip source-interface ntp interface 1/1/2 vrf green
ip source-interface tacacs interface 1/1/2 vrf green
ip source-interface dns interface 1/1/2 vrf green
ip source-interface central interface 1/1/2 vrf green
ip source-interface all interface 1/1/2 vrf green
ipv6 source-interface tftp 2222::3333 vrf green
ipv6 source-interface radius 2222::3333 vrf green
ipv6 source-interface ntp 2222::3333 vrf green
ipv6 source-interface tacacs 2222::3333 vrf green
ipv6 source-interface central 2222::3333 vrf green
ipv6 source-interface all 2222::3333 vrf green
ip source-interface tftp 10.20.3.1
ip source-interface radius 10.20.3.1
ip source-interface ntp 10.20.3.1
ip source-interface tacacs 10.20.3.1
ip source-interface dns 10.20.3.1
ip source-interface central 10.20.3.1
ip source-interface all 10.20.3.1
```

```
interface 1/1/1
     no shutdown
     ip address 10.20.3.1/24
interface 1/1/2
     vrf attach green
     ip address 20.1.1.1/24
     ipv6 address 2222::3333/64
interface 1/1/45
     no shutdown
     ip address 100.1.0.1/24
     ipv6 address 1111::2222/64
ip route 100.2.0.0/24 10.20.3.2
switch#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# Chapter 145

# SSH client commands

## ssh (client login)

```
ssh [<USERNAME>@]{<IPV4> | <HOSTNAME>} [vrf <VRF-NAME>] [port <PORT-NUMBER>]
```

### Description

Establishes a client session with an SSH server which is typically another switch.

username, vrf and port number are optional parameters. If a source ip address or source interface is configured for the ssh client protocol, the configuration values are used for establishing the client session with the SSH server.

> The source interface can be configured using the IP source interface configuration commands described in the Fundamentals Guide.

| Parameter | Description |
|---|---|
| *<USERNAME>* | Specifies the username that the client uses to log in to an SSH server. When omitted, the username of the current session is used. |
| *<IPV4>* | Specifies the SSH server to which the SSH client will connect as an IPv4 address. |
| *<HOSTNAME>* | Specifies the SSH server to which the SSH client will connect as a host name. |
| vrf *<VRF-NAME>* | Specifies the VRF to be used for the SSH client session. When omitted, the default VRF named `default` is used. |
| port *<PORT-NUMBER>* | Specifies the SSH server TCP port number. When omitted, the default TCP port 22 is used. |

### Examples

Establishing an SSH client session (using the management VRF) with an SSH server:

```
switch# ssh admin@10.0.11.180 vrf mgmt
```

Establishing an SSH client session (using the default VRF and a specific port) with an SSH server:

```
switch# ssh admin@10.0.11.175 port 223
```

Configuring a test user on switch 1 and then connecting to switch 1 from switch 2 using the SSH client on the mgmt VRF:

```
** Configuring a test user on switch 1 **
switch(config)# user-group test
switch(config-usr-grp-test)# permit cli command ".*"
switch(config)# exit
switch(config)# user test-user group test password plaintext tst#9J

** On switch 2, connecting to switch 1 using the SSH client **
switch# ssh test-user@10.0.11.177 vrf mgmt
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# Chapter 146
# SSH client commands

## ssh (client login)

`ssh [<USERNAME>@]{<IPV4> | <HOSTNAME>} [vrf <VRF-NAME>] [port <PORT-NUMBER>]`

### Description

Establishes a client session with an SSH server which is typically another switch.

username, vrf and port number are optional parameters. If a source ip address or source interface is configured for the ssh client protocol, the configuration values are used for establishing the client session with the SSH server.

> The source interface can be configured using the IP source interface configuration commands described in the Fundamentals Guide.

| Parameter | Description |
|---|---|
| *<USERNAME>* | Specifies the username that the client uses to log in to an SSH server. When omitted, the username of the current session is used. |
| *<IPV4>* | Specifies the SSH server to which the SSH client will connect as an IPv4 address. |
| *<HOSTNAME>* | Specifies the SSH server to which the SSH client will connect as a host name. |
| vrf *<VRF-NAME>* | Specifies the VRF to be used for the SSH client session. When omitted, the default VRF named `default` is used. |
| port *<PORT-NUMBER>* | Specifies the SSH server TCP port number. When omitted, the default TCP port 22 is used. |

### Examples

Establishing an SSH client session (using the management VRF) with an SSH server:

```
switch# ssh admin@10.0.11.180 vrf mgmt
```

Establishing an SSH client session (using the default VRF and a specific port) with an SSH server:

```
switch# ssh admin@10.0.11.175 port 223
```

Configuring a test user on switch 1 and then connecting to switch 1 from switch 2 using the SSH client on the mgmt VRF:

```
** Configuring a test user on switch 1 **
switch(config)# user-group test
switch(config-usr-grp-test)# permit cli command ".*"
switch(config)# exit
switch(config)# user test-user group test password plaintext tst#9J

** On switch 2, connecting to switch 1 using the SSH client **
switch# ssh test-user@10.0.11.177 vrf mgmt
```

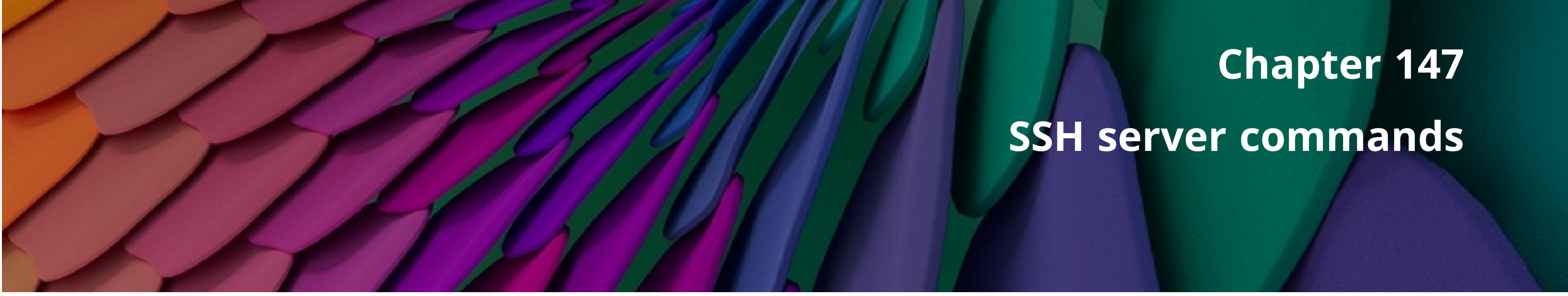
For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 147

# SSH server commands

## show ssh host-key

`show ssh host-key [ecdsa | ed25519 | rsa]`

### Description

Shows the public host keys for the SSH server. If the key type is not provided, all available host-keys are shown.

| Parameter | Description |
|---|---|
| `ecdsa` | Selects the ECDSA host-key pair. |
| `ed25519` | Selects the ED25519 host-key pair. |
| `rsa` | Selects the RSA host-key pair. |

### Examples

Showing the ECDSA public host-key:

```
switch# show ssh host-key ecdsa

Key Type : ECDSA     Curve : ecdsa-sha2-nistp256

ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAhtuv5rABBBGs
...
O4mjVFGMVKZ87RWkyrxeQa2fAGZZEp1902K33/k3q17fA4EivRzC75YvjDu8=
```

Showing all public host keys:

```
switch# show ssh host-key
Key Type : ECDSA     Curve : ecdsa-sha2-nistp256
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAhtuv5rABBBGs
...
O4mjVFGMVKZ87RWkyrxeQa2fAGZZEp1902K33/k3q17fA4EivRzC75YvjDu8=

Key Type : ED25519
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIGb6910Jwoe8Hkl9K5YhqijrWI3yovNbiJVq6tw4WjJr4

Key Type : RSA       Key Size : 2048
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDdVCXlw43h4n1bwg9jI6DSBMngymCdPD0JUG42Sn9IS
...
nGSXtrNy6OmlFDJTAy+zz5Kd8d21ZLuhf07IHNgF3pff65Xc8qNJBv
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show ssh server

```
show ssh server [vrf <VRF-NAME> | all-vrfs] [vsx-peer]
```

## Description

Shows the SSH server configuration for the specified VRF. Administrators can show the server configuration of all VRFs by using the **all-vrfs** parameter. If no VRF name is provided in this command, the command shows the SSH server configuration on the default VRF.

| Parameter | Description |
|---|---|
| `vrf <VRF-NAME>` | Specifies the VRF name. |
| `all-vrfs` | Selects all VRFs. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Showing the SSH server configuration on the default VRF:

```
switch# show ssh server

SSH server configuration on VRF default :

   IP Version        :  IPv4 and IPv6        SSH Version          : 2.0
   TCP Port          :  22                   Grace Timeout (sec)  : 120
   Max Auth Attempts :         6
   Allow-list        : disabled


   Ciphers:
   chacha20-poly1305@openssh.com, aes128-ctr, aes192-cbc,
   aes128-cbc, aes192-ctr, aes256-gcm@openssh.com,
   aes128-gcm@openssh.com, aes256-ctr, aes256-cbc

   Host Key Algorithms:
   ecdsa-sha2-nistp256, ecdsa-sha2-nistp384, ecdsa-sha2-nistp521,
    ssh-ed25519, rsa-sha2-256, rsa-sha2-512, ssh-rsa

    Key Exchange Algorithms:
    curve25519-sha256, curve25519-sha256@libssh.org,
    ecdh-sha2-nistp256,ecdh-sha2-nistp384, ecdh-sha2-nistp521,
    diffie-hellman-group-exchange-sha256,diffie-hellman-group16-sha512,
    diffie-hellman-group18-sha512,diffie-hellman-group14-sha256,
    diffie-hellman-group14-sha1

    MACs:
    hmac-sha1-etm@openssh.com, umac-64@openssh.com,
    umac-128@openssh.com, hmac-sha2-256,hmac-sha2-512,hmac-sha1

    Public Key Algorithms:
    rsa-sha2-256, rsa-sha2-512ssh-rsa, ecdsa-sha2-nistp256,
    ecdsa-sha2-nistp384, ecdsa-sha2-nistp521, ssh-ed25519,
    x509v3-rsa2048-sha256, x509v3-ssh-rsa, x509v3-sign-rsa,
    x509v3-ecdsa-sha2-nistp256, x509v3-ecdsa-sha2-nistp384,
    x509v3-ecdsa-sha2-nistp521
```

Showing the SSH server configuration on the management VRF:

```
switch# show ssh server vrf mgmt

SSH server configuration on VRF mgmt :

    IP Version             : IPv4 and IPv6        SSH Version          : 2.0
    TCP Port               : 22                   Grace Timeout (sec)  : 120
    Max Auth Attempts      : 6

    Ciphers:
    chacha20-poly1305@openssh.com, aes128-ctr, aes192-cbc,
    aes128-cbc, aes192-ctr, aes256-gcm@openssh.com,
    aes128-gcm@openssh.com, aes256-ctr, aes256-cbc

    Host Key Algorithms:
    ecdsa-sha2-nistp256, ecdsa-sha2-nistp384, ecdsa-sha2-nistp521,
    ssh-ed25519, rsa-sha2-256, rsa-sha2-512, ssh-rsa

    Key Exchange Algorithms:
    curve25519-sha256, curve25519-sha256@libssh.org,
    ecdh-sha2-nistp256,ecdh-sha2-nistp384, ecdh-sha2-nistp521,
    diffie-hellman-group-exchange-sha256,diffie-hellman-group16-sha512,
    diffie-hellman-group18-sha512,diffie-hellman-group14-sha256,
    diffie-hellman-group14-sha1

    MACs:
    hmac-sha1-etm@openssh.com, umac-64@openssh.com,
    umac-128@openssh.com, hmac-sha2-256,hmac-sha2-512,hmac-sha1

    Public Key Algorithms:
    rsa-sha2-256, rsa-sha2-512ssh-rsa, ecdsa-sha2-nistp256,
    ecdsa-sha2-nistp384, ecdsa-sha2-nistp521, ssh-ed25519,
    x509v3-rsa2048-sha256, x509v3-ssh-rsa, x509v3-sign-rsa,
    x509v3-ecdsa-sha2-nistp256, x509v3-ecdsa-sha2-nistp384,
```

Showing the SSH server configuration for all VRFs:

```
switch# show ssh server all-vrfs

SSH server configuration on VRF default :

    IP Version              :  IPv4 and IPv6       SSH Version          : 2.0
    TCP Port                :  22                  Grace Timeout (sec)  : 120
    Max Auth Attempts       :  6

    Ciphers:
    chacha20-poly1305@openssh.com, aes128-ctr, aes192-cbc,
    aes128-cbc, aes192-ctr, aes256-gcm@openssh.com,
    aes128-gcm@openssh.com, aes256-ctr, aes256-cbc

    Host Key Algorithms:
    ecdsa-sha2-nistp256, ecdsa-sha2-nistp384, ecdsa-sha2-nistp521,
    ssh-ed25519, rsa-sha2-256, rsa-sha2-512, ssh-rsa

    Key Exchange Algorithms:
    curve25519-sha256, curve25519-sha256@libssh.org,
    ecdh-sha2-nistp256,ecdh-sha2-nistp384, ecdh-sha2-nistp521,
    diffie-hellman-group-exchange-sha256,diffie-hellman-group16-sha512,
    diffie-hellman-group18-sha512,diffie-hellman-group14-sha256,


    MACs:
    hmac-sha1-etm@openssh.com, umac-64@openssh.com,
    umac-128@openssh.com, hmac-sha2-256,hmac-sha2-512,hmac-sha1

    Public Key Algorithms:
    rsa-sha2-256, rsa-sha2-512ssh-rsa, ecdsa-sha2-nistp256,
    ecdsa-sha2-nistp384, ecdsa-sha2-nistp521, ssh-ed25519,
    x509v3-rsa2048-sha256, x509v3-ssh-rsa, x509v3-sign-rsa,
    x509v3-ecdsa-sha2-nistp256, x509v3-ecdsa-sha2-nistp384,
    x509v3-ecdsa-sha2-nistp521

SSH server configuration on VRF mgmt :

    IP Version              : IPv4 and IPv6       SSH Version          : 2.0
    TCP Port                : 22                  Grace Timeout (sec)  : 120
    Max Auth Attempts       : 6

    Ciphers:
    chacha20-poly1305@openssh.com, aes128-ctr, aes192-cbc,
    aes128-cbc, aes192-ctr, aes256-gcm@openssh.com,
    aes128-gcm@openssh.com, aes256-ctr, aes256-cbc

    Host Key Algorithms:
    ecdsa-sha2-nistp256, ecdsa-sha2-nistp384, ecdsa-sha2-nistp521,
    ssh-ed25519, rsa-sha2-256, rsa-sha2-512, ssh-rsa

    Key Exchange Algorithms:
    curve25519-sha256, curve25519-sha256@libssh.org,
    ecdh-sha2-nistp256,ecdh-sha2-nistp384, ecdh-sha2-nistp521,
    diffie-hellman-group-exchange-sha256,diffie-hellman-group16-sha512,
    diffie-hellman-group18-sha512,diffie-hellman-group14-sha256,
    diffie-hellman-group14-sha1

    MACs:
    hmac-sha1-etm@openssh.com, umac-64@openssh.com,
    umac-128@openssh.com, hmac-sha2-256,hmac-sha2-512,hmac-sha1
```

```
Public Key Algorithms:
rsa-sha2-256, rsa-sha2-512ssh-rsa, ecdsa-sha2-nistp256,
ecdsa-sha2-nistp384, ecdsa-sha2-nistp521, ssh-ed25519,
x509v3-rsa2048-sha256, x509v3-ssh-rsa, x509v3-sign-rsa,
x509v3-ecdsa-sha2-nistp256, x509v3-ecdsa-sha2-nistp384,
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show ssh server sessions

`show ssh server sessions [vrf <VRF-NAME> | all-vrfs] [vsx-peer]`

### Description

Shows the active SSH sessions on a specified VRF or on all VRFs. If no VRF is specified, the active sessions on the **default** VRF are shown.

| Parameter | Description |
|---|---|
| `vrf <VRF-NAME>` | Specifies the VRF name. |
| `all-vrfs` | Selects all VRFs. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

If you provide the command with a VRF name, the command shows the active SSH session for the specified VRF. Any user can show sessions of all VRFs by using the **all-vrfs** parameter. The maximum number of sessions per VRF is five. The maximum SSH idle session timeout is 60 seconds.

### Examples

Showing the active SSH sessions on the default VRF:

```
switch# show ssh server sessions

SSH sessions on VRF default
    IPv4 SSH Sessions
        Server IP         : 10.1.1.1
        Client IP         : 10.1.1.2
        Client Port       : 58835

    IPv6 SSH Sessions
        Server IP         : FF01:0:0:0:0:0:0:FB
        Client IP         : FF01:0:0:0:0:0:0:FC
        Client Port       : 58836
```

Showing the SSH server configuration for all VRFs:

```
switch# show ssh server sessions all-vrf

SSH sessions on VRF mgmt
    IPv4 SSH Sessions
        Server IP         : 10.1.1.1
        Client IP         : 10.1.1.2
        Client Port       : 58835

    IPv6 SSH Sessions
        Server IP         : FF01:0:0:0:0:0:0:FB
        Client IP         : FF01:0:0:0:0:0:0:FC
        Client Port       : 58836

SSH sessions on VRF default
    IPv4 SSH Sessions
        Server IP         : 20.1.1.1
        Client IP         : 20.1.1.2
        Client Port       : 58837

    IPv6 SSH Sessions
        Server IP         : FF01:0:0:0:0:0:0:FD
        Client IP         : FF01:0:0:0:0:0:0:FE
        Client Port       : 58838
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# ssh ciphers

```
ssh ciphers <CIPHERS-LIST>
no ssh ciphers
```

## Description

Configures SSH to use a set of ciphers in the specified priority order. Ciphers in SSH are used for privacy of data being transported over the connection. The first cipher type entered in the CLI is considered a first priority. Each option is an algorithm that is used to encrypt the link and each name indicates the algorithm and cryptographic parameters that are used. Only ciphers that are entered by the user are configured.

The **no** form of this command removes the configuration of ciphers and reverts SSH to use the default set of ciphers.

| Parameter | Description |
|---|---|
| *<CIPHERS-LIST>* | Valid ciphers:<br>▪ **aes128-cbc**<br>▪ **aes192-cbc**<br>▪ **aes256-cbc**<br>▪ **aes128-ctr**<br>▪ **aes192-ctr**<br>▪ **aes256-ctr**<br>▪ **aes128-gcm@openssh.com**<br>▪ **aes256-gcm@openssh.com**<br>▪ **chacha20-poly1305@openssh.com**<br>Default set of ciphers in priority order (highest at top):<br>▪ **chacha20-1305@openssh.com**<br>▪ **aes128-ctr**<br>▪ **aes192-ctr**<br>▪ **aes256-ctr**<br>▪ **aes128-gcm@openssh.com**<br>▪ **aes256-gcUm@openssh.com** |

## Examples

Configuring SSH to use only specified ciphers in the priority order:

```
switch(config)# ssh ciphers chacha20-poly1305@openssh.com aes256-ctr aes256-cbc
```

Reverting SSH to use the default set of ciphers:

```
switch(config)# no ssh ciphers
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh host-key

```
ssh host-key {ecdsa [ecdsa-sha2-nistp256 | ecdsa-sha2-nistp384 | ecdsa-sha2-nistp521] |
    ed25519 | rsa [bits {2048 | 4096}] }
```

### Description

Generates an SSH host-key pair.

| Parameter | Description |
|---|---|
| `ecdsa` | Selects the ECDSA host-key pair type as **ecdsa-sha2-nistp256** (the default), **ecdsa-sha2-nistp384**, or **ecdsa-sha2-nistp521**. |
| `ed25519` | Selects the ED25519 host-key pair. |
| `rsa` | Selects the RSA host-key pair. Optionally, the key bit length is selected with either **bits 2048** (the default) or **bits 4096**. |

### Usage

When an SSH server is enabled on a VRF for the first time, host-keys are generated.

If the host-key of the given type exists, a warning message is displayed with a request to overwrite the previous host-key with the new key.

### Examples

Overwriting an old ECDSA host-key with a new ecdsa-sha2-nistp384 host-key:

```
switch(config)# ssh host-key ecdsa ecdsa-sha2-nistp384
ecdsa host-key will be overwritten.
Do you want to continue (y/n)?
```

Overwriting an old RSA host-key with a new RSA host-key with 2048 bits:

```
switch(config)# ssh host-key rsa bits 2048
rsa host-key will be overwritten.
Do you want to continue (y/n)?
```

Overwriting an ECDSA host-key with an ED25519 host-key pair:

```
switch(config)# ssh host-key ed25519
ed25519 host-key will be overwritten.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh host-key-algorithms

```
ssh host-key-algorithms <HOST-KEY-ALGORITHMS-LIST>
no ssh host-key-algorithms
```

### Description

Configures SSH to use a set of host key algorithms in the specified priority order. Host key algorithms specify which host key types are allowed to be used for the SSH connection. The first host key entered in the CLI is considered a first priority. Each option represents a type of key that can be used. Host keys are used to verify the host that you are connecting to. This configuration allows you to control which host key types are presented to incoming clients, or which host key types to receive first from hosts. Only the host key algorithms that are specified by the user are configured.

The **no** form of this command removes the configuration of host key algorithms and reverts SSH to use the default set of algorithms.

| Parameter | Description |
|---|---|
| *<HOST-KEY-ALGORITHMS-LIST>* | Default set of public key algorithms in priority order (highest at top), comprised of all possible valid algorithms:<br>▪ **ecdsa-sha2-nistp256**<br>▪ **ecdsa-sha2-nistp384**<br>▪ **ecdsa-sha2-nistp521**<br>▪ **ssh-ed25519**<br>▪ **rsa-sha2-256**<br>▪ **rsa-sha2-512**<br>▪ **ssh-rsa** |

### Examples

Configuring SSH to use only specified host key algorithms:

```
switch(config)# ssh host-key-algorithms ssh-rsa ssh-ed25519 ecdsa-sha2-nistp521
```

Reverting SSH to use the default set of host key algorithms:

```
switch(config)# no host-key-algorithms
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh key-exchange-algorithms

```
ssh key-exchange-algorithms <KEY-EXCHANGE-ALGORITHMS-LIST>
no ssh key-exchange-algorithms
```

### Description

Configures SSH to use a set of key exchange algorithm types in the specified priority order. The first key exchange type entered in the CLI is considered a first priority. Key exchange algorithms are used to exchange a shared session key with a peer securely. Each option represents an algorithm that is used to distribute a shared key in a way that prevents outside interference, manipulation, or recovery. Only the key exchange algorithms that are specified by the user are configured.

The **no** form of this command removes the configuration of key exchange algorithms and reverts SSH to use the default set of algorithms.

| Parameter | Description |
|---|---|
| *<KEY-EXCHANGE-ALGORITHMS-LIST>* | Valid key exchange algorithms:<br>■ **curve25519-sha256**<br>■ **curve25519-sha256@libssh.org**<br>■ **diffie-hellman-group-exchange-sha1**<br>■ **diffie-hellman-group-exchange-sha256**<br>■ **diffie-hellman-group14-sha1**<br>■ **diffie-hellman-group14-sha256**<br>■ **diffie-hellman-group16-sha512**<br>■ **diffie-hellman-group18-sha512**<br>■ **ecdh-sha2-nistp256** |

| Parameter | Description |
|---|---|
| | ■ **ecdh-sha2-nistp384**<br>■ **ecdh-sha2-nistp521**<br>Default set of key exchange algorithms in priority order (highest at top):<br>■ **curve25519-sha256**<br>■ **curve25519-sha256@libssh.org**<br>■ **ecdh-sha2-nistp256**<br>■ **ecdh-sha2-nistp384**<br>■ **ecdh-sha2-nistp521**<br>■ **diffie-hellman-group-exchange-sha256**<br>■ **diffie-hellman-group16-sha512**<br>■ **diffie-hellman-group18-sha512**<br>■ **diffie-hellman-group14-sha256**<br>■ **diffie-hellman-group-exchange-sha1** |

### Examples

Configuring SSH to use a set of specified key exchange algorithms:

```
switch(config)# ssh key-exchange-algorithms ecdh-sha2-nistp256 curve25519-sha256
 diffie-hellman-group-exchange-sha256
```

Reverting SSH to use the default set of key-exchange-algorithms:

```
switch(config)# no key-exchange-algorithms
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh known-host remove

`ssh known-host remove {all | {<IPv4-ADDRESS> | <HOSTNAME> | <IPv6-ADDRESS>} }`

### Description

Clears the list of trusted SSH servers for your user account. When you download or upload a file to or from a server using SFTP, you establish a trusted SSH relationship with that server. Each user account maintains its own set of SSH server host-keys for every server to which the user previously connected.

| Parameter | Description |
|---|---|
| `all` | Clears the trusted servers list. |
| *<IPv4-ADDRESS>* | Specifies the IPv4 address of the remote device. |
| *<HOSTNAME>* | Specifies the host name of the remote device. Range: up to 255 characters. |
| *<IPv6-ADDRESS>* | Specifies the IPv6 address of the remote device. |

### Examples

Clearing the trusted server list:

```
switch(config)# ssh known-host remove all
```

Removing a specified server from the trusted server list:

```
switch(config)# ssh known-host remove 1.1.1.1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh macs

```
ssh macs <MACS-LIST>
no ssh macs
```

### Description

Configures SSH to use a set of message authentication codes (MACs) in the specified priority order. The first MAC entered in the CLI is considered a first priority. MACs maintain the integrity of each message sent across an SSH connection. Each option represents an algorithm that can be used to provide integrity between peers. Only the MAC types that are specified by the user are configured.

The **no** form of this command removes the configuration of MACs and reverts SSH to use the default set of MACs.

| Parameter | Description |
|---|---|
| *<MACS-LIST>* | Valid MACs:<br>- **hmac-sha1**<br>- **hmac-sha1-96**<br>- **hmac-sha1-etm@openssh.com**<br>- **hmac-sha2-256**<br>- **hmac-sha2-512**<br>- **hmac-sha2-256-etm@openssh.com**<br>- **hmac-sha2-512-etm@openssh.com**<br>Default set of MACs in priority order (highest at top):<br>- **hmac-sha2-256-etm@openssh.com**<br>- **hmac-sha2-512-etm@openssh.com**<br>- **hmac-sha1-etm@openssh.com**<br>- **hmac-sha2-256**<br>- **hmac-sha2-512**<br>- **hmac-sha1** |

### Examples

Configuring SSH to use a set of specified MACs:

```
switch(config)# ssh macs hmac-sha2-256 hmac-sha2-512
```

Reverting SSH to use the default set of MACs:

```
switch(config)# no ssh macs
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh maximum-auth-attempts

```
ssh maximum-auth-attempts <ATTEMPTS>
no maximum-auth-attempts
```

### Description

Sets the SSH maximum number of authentication attempts.

The **no** form of the command resets the maximum to its default of 6.

| Parameter | Description |
|---|---|
| *<ATTEMPTS>* | Specifies the maximum number of SSH authentication attempts. Range: 1 to 10. Default: 6. |

### Examples

Setting the maximum number of authentication attempts:

```
switch(config)# ssh maximum-auth-attempts 3
```

Resetting the maximum number of authentication attempts to its default of 6:

```
switch(config)# no maximum-auth-attempts
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |

## ssh public-key-algorithms

```
ssh public-key-algorithms <PUBLIC-KEY-ALGORITHMS-LIST>
no ssh public-key-algorithms
```

### Description

Configures SSH to use a set of public key algorithms in the specified priority order. The first public key type entered in the CLI is considered a first priority. Public key algorithms specify which public key types can be used for public key authentication in SSH. Each option represents a public key type that the SSH server can accept or that the SSH client can present to a server. Only the public key algorithms that are chosen by the user are configured.

The **no** form of this command removes the configuration of public key algorithms and reverts SSH to use the default set.

| Parameter | Description |
|---|---|
| *<PUBLIC-KEY-ALGORITHMS-LIST>* | Default set of public key algorithms in priority order (highest at top), comprised of all possible valid algorithms:<br>■ **rsa-sha2-256**<br>■ **rsa-sha2-512**<br>■ **ssh-rsa**<br>■ **ecdsa-sha2-nistp256**<br>■ **ecdsa-sha2-nistp384**<br>■ **ecdsa-sha2-nistp521**<br>■ **ssh-ed25519**<br>■ **x509v3-rsa2048-sha256**<br>■ **x509v3-ssh-rsa**<br>■ **x509v3-sign-rsa**<br>■ **x509v3-ecdsa-sha2-nistp256**<br>■ **x509v3-ecdsa-sha2-nistp384**<br>■ **x509v3-ecdsa-sha2-nistp521** |

### Examples

Configuring SSH to use a set of specified public key algorithms:

```
switch(config)# ssh public-key-algorithms x509v3-ssh-rsa ssh-rsa rsa-sha2-256
```

Reverting SSH to use the default set of public key algorithms:

```
switch(config)# no ssh public-key-algorithms
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |

# ssh server allow-list

```
ssh server allow-list
  ip <ipv4-addr>[mask]
```

```
ipv6 <ipv6-addr>[mask]
enable
no
```

## Description

Configure a list of addresses that will be the only hosts allowed to connect to the SSH servers running on all VRFs of the switch. By default, the allow-list is disabled and any host is allowed to connect given the correct authentication criteria. When the allow-list is enabled, only the hosts that fall under one of the entries may connect with the correct authentication criteria, all other hosts will be denied to attempt authentication.

| Parameter | Description |
|---|---|
| *ip <ipv4-addr>[mask]* | An allowed host IP address and (optional) subnet in any of the following formats:<br>▪ **A.B.C.D**: An allowed IPv4 address<br>▪ **A.B.C.D/M**: An allowed IPv4 subnet with prefix length<br>▪ **A.B.C.D W.X.Y.Z**: An allowed IPv4 address with network mask<br>▪ **A.B.C.D/W.X.Y.Z**: An allowed IPv4 address with network mask |
| *ipv6 <iv6p-addr>[mask]* | An allowed host IPv6 address and (optional) subnet in any of the following formats:<br>▪ **X:X::X:X**: An allowed IPv6 address<br>▪ **X:X::X:X/M**: An allowed IPv6 subnet |
| enable | Enable the allow-list. |
| no ... | Negate a command or set its default. |

## Usage

The allow-list can contain up to 20 entries of IPv4 or IPv6 addresses, including entire subnets. The order in which the entries are added to the list does not matter. The configuration will only take effect once the allow-list is enabled by issuing the **enable** command in the the *config-ssh-al* (**ssh server allow-list**) context.

When the allow-list is enabled, SSH servers on all VRFs will restart and all active SSH sessions will be terminated. The enabled allow-list may be modified to remove existing entries or add new entries, and each of those modifications will trigger an SSH server restart for all VRFs and will terminate all active SSH sessions, which may include the current user if they are connected via SSH. If you disable the allow-list before making changes and enabling the allow-list again once the changes are made, any host will be allowed to connect during the modification period before the allow-list is re-enabled. When the allow-list is disabled, the SSH servers on all VRFs will restart and active SSH sessions will persist.

Every SSH allow-list ends with an implicit **deny all** rule. When you add entries to an allow list, take care to avoid blocking connectivity to the SSH server. If an SSH allow-list is enabled with no entries configured, the **deny all** functionality will block all addresses, and the SSH server will be unusable.

## Examples

Configuring and enabling an SSH server allow list

```
switch(config)# ssh server allow-list
switch(config-ssh-al)# 1.1.1.1
switch(config-ssh-al)# enable
Active SSH sessions will be terminated.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` and `config-ssh-al` contexts | Administrators or local user group members with execution rights for this command. |

## ssh server port

```
ssh server port <PORT-NUMBER>
no ssh server port [<PORT-NUMBER>]
```

### Description

Configures SSH server to listen on a particular TCP port number. The default value is 22.

This port will be used for all VRFs that have SSH server enabled.

Configuring the TCP port number restarts the SSH server and terminates all active SSH sessions. It may take a few seconds for the SSH sessions to reach the running state on some VRFs.

The **no** form of the command resets the TCP port number to the default, 22.

| Parameter | Description |
|---|---|
| *<PORT-NUMBER>* | Specifies the TCP port number. Range: 1 to 65535. Default: 22. |

### Examples

Configuring TCP port number `19222`:

```
switch(config)# ssh server port 19222
```

Resetting the TCP port number to the default, `22`:

```
switch(config)# no ssh server port
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11.1000 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh server vrf

```
ssh server vrf <VRF-NAME>
no ssh server vrf <VRF-NAME>
```

### Description

Enables the SSH server on the specified VRF. SSH is disabled by default and will not be operational till the admin password is set on the switch. Note that the admin password is considered set even if it is configured to be empty.

The **no** form of the command disables the SSH server on the specified VRF. If no VRF is specified, by default the SSH server will be enabled on the **default** or **mgmt** VRF, depending on the switch model.

| Parameter | Description |
|---|---|
| `vrf <VRF-NAME>` | Specifies the VRF name. |

### Examples

Enabling the SSH server on the management VRF:

```
switch(config)# ssh server vrf mgmt
```

Disabling the SSH server on the management VRF:

```
switch(config)# no ssh server vrf mgmt
```

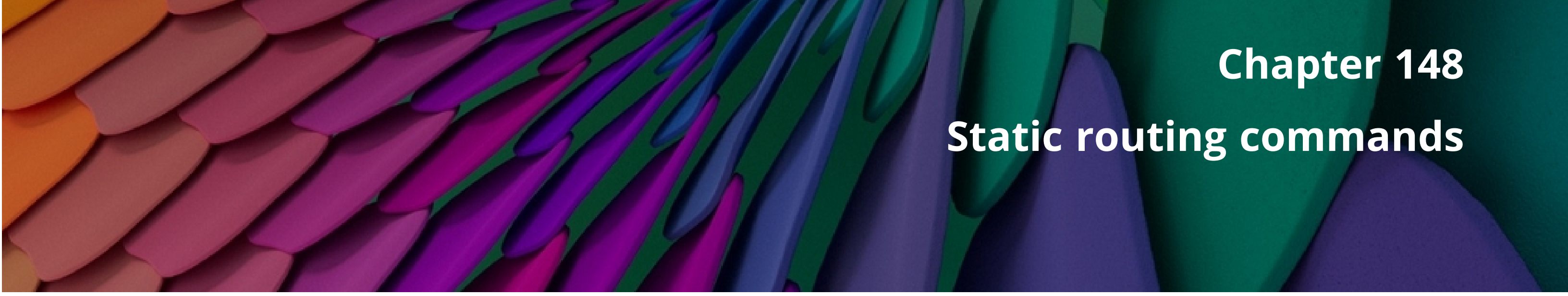
For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |



# Chapter 148

# Static routing commands

## ip route

```
ip route <DEST-IPV4-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> | reject |
   nullroute}
no ip route <DEST-IPV4-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> | reject
|
   nullroute}
```

### Description

Adds an IPv4 static route on the default VRF.

The **no** form of this command deletes a IPv4 static route.

You can configure a maximum of 32 next hops per route.

| Parameter | Description |
|---|---|
| *<DEST-IPV4-ADDR>/<NETMASK>* | Specifies the IPv4 route destination. |
| *<NEXTHOP-ADDR>* | Specifies the next hop address for reaching the destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<NEXTHOP-PORT-LAG-VLAN>* | Specifies the next hop as an outgoing interface. |
| nullroute | Specifies that packets matching the destination route are silently discarded and no ICMP error notification is sent to the sender. |
| reject | Specifies that packets matching the destination route are discarded and an ICMP error notification is sent to the sender. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

```
switch(config)# ip route 10.0.0.0/24 nullroute
switch(config)# ip route 10.0.1.0/24 reject
switch(config)# ip route 10.0.2.0/24 20.0.0.2
switch(config)# ip route 10.0.3.0/24 1/1/1
switch(config)# ip route 10.0.3.0/24 1/1/1.110
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ip route bfd

```
ip route <DEST-IPV4-ADDR>/<NETMASK> [<NEXT-HOP-IP-ADDR> | <INTERFACE>] [bfd]
no ip route <DEST-IPV4-ADDR>/<NETMASK> [<NEXT-HOP-IP-ADDR> | <INTERFACE>] [bfd]
```

### Description

Enables or disables BFD on the specified static route. To disable BFD, issue the command without the `bfd` option.

| Parameter | Description |
|---|---|
| *<DEST-IPV4-ADDR>* | Specifies a route destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<NETMASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXT-HOP-IP-ADDR>* | Specifies the next hop address for reaching the destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<INTERFACE>* | Specifies the next hop as an outgoing interface. |
| `bfd` | Enables BFD on the static route. Omit this parameter to disable BFD. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling BFD on a static route:

```
switch(config)# interface 1/1/1
switch(config-if)# ip address 20.1.1.2/24
switch(config-if)# no shutdown
switch(config-if)# routing
switch(config-if)# exit
switch(config)# ip route 192.0.0.0/8 20.1.1.1 bfd
```

Disabling BFD on a static route:

```
switch(config)# ip route 192.0.0.0/8 20.1.1.1
```

For more information on features that use this command, refer to the High Availability Guide or IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# ip route distance

```
ip route <DEST-IPV4-ADDR>/<NETMASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>] distance <VALUE>
no ip route <DEST-IPV4-ADDR>/<NETMASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>] distance <VALUE>
```

### Description

Configures the administrative distance for the IPv4 static route.

The **no** form of this command deletes the static route.

| Parameter | Description |
|---|---|
| *<DEST-IPV4-ADDR>>* | Specifies an IP address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<MASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 32. |
| *<NEXT-HOP-IP-ADDR>* | Specifies the next hop IPv4 address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<INTERFACE>* | Specifies the next hop as an outgoing interface. |
| distance *<VALUE>* | Specifies the administrative distance to associate with this static route. Default: 1. Range: 1-255. |

### Examples

```
switch(config)# ip route 10.0.2.0/24 20.0.0.2 distance 4
switch(config)# ip route 10.0.3.0/24 1/1/1 distance 6
switch(config)# no ip route 10.0.3.0/24 1/1/1 distance 6
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## ip route tag

```
ip route <DEST-IPV4-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> | reject |
   nullroute} [tag] <1-4294967295>
no ip route <DEST-IPV4-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> | reject
|
   nullroute} [tag] <1-4294967295>
```

### Description

Configures tag for IPv4 static route.

The **no** form of this command deletes tag for IPv4 static route.

| Parameter | Description |
|---|---|
| *<DEST-IPV4-ADDR>/<NETMASK>* | Specifies the IPv4 route destination. |
| *<NEXTHOP-ADDR>* | Specifies the next hop address for reaching the destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<NEXTHOP-PORT-LAG-VLAN>* | Specifies the next hop as an outgoing interface. |
| `reject` | Specifies that packets matching the destination route are discarded and an ICMP error notification is sent to the sender. |
| `nullroute` | Specifies that packets matching the destination route are silently discarded and no ICMP error notification is sent to the sender. |
| `tag` | Specifies and assigns tag for the route. |

### Examples

```
switch(config)# ip route 10.1.1.1/32 20.1.1.2 tag 10
switch(config)# ip route 10.1.1.5/32 1/1/1 tag 20
```

```
switch(config)# no ip route 10.1.1.1/32 20.1.1.2 tag 10
switch(config)# no route 10.1.1.5/32 1/1/1 tag 20
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ip route vrf

```
ip route <DEST-IPV4-ADDR>/<MASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
   vrf <VRF-NAME>
no ip route <DEST-IPV4-ADDR>/<MASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
   vrf <VRF-NAME>
```

### Description

Adds the destination IPv4 static route on the specified VRF. If no *<VRF-NAME>* is specified the route is applied to the default VRF.

The **no** form of this command removes the IPv4 static route from the VRF.

| Parameter | Description |
|---|---|
| *<DEST-IPV6-ADDR>* | Specifies the route destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<MASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXT-HOP-IP-ADDR>* | Specifies the next hop in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<INTERFACE>* | Specifies the next hop as an outgoing interface. |
| `nullroute` | Silently discards packets to the destined route. |

| Parameter | Description |
|---|---|
| `reject` | Discards packets to the destined route and returns an ICMP error to the sender. |
| `vrf <VRF-NAME>` | Specifies a VRF name. |

### Examples

```
switch(config)# ip route 20.0.0.0/8 10.20.30.44 vrf myvrf
switch(config)# ip route 20.1.2.0/24 1/1/30 vrf myvrf
switch(config)# ip route 1.2.3.4/32 nullroute vrf myvrf
switch(config)# ip route 1.2.3.4/32 reject vrf myvrf
```

```
switch(config)# no ip route 20.0.0.0/8 10.20.30.44 vrf myvrf
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# ipv6 route

```
ipv6 route <DEST-IPV6-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> | reject
|   nullroute}
no ipv6 route <DEST-IPV6-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> |
   reject | nullroute}
```

### Description

Adds an IPv6 static route.

The **no** form of this command deletes an IPv6 static route on the default VRF.

| Parameter | Description |
|---|---|
| *<DEST-IPV6-ADDR>* | Specifies the route destination in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a |

| Parameter | Description |
|---|---|
|  | hexadecimal number from 0 to F. |
| *<NETMASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXTHOP-ADDR>* | Specifies the next hop in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<NEXTHOP-PORT-LAG-VLAN>* | Specifies the next hop as an outgoing interface. |
| `reject` | Specifies that packets matching the destination route are discarded and an ICMP error notification is sent to the sender. |
| `nullroute` | Specifies that packets matching the destination route are silently discarded and no ICMP error notification is sent to the sender. |

## Usage

On the 6200, 6300, 6400, 8100, and 8360 switch series, a limited number of IPv6 routes with prefixes from 65-127 can be programmed in the ASIC; this allows for hardware/line-rate forwarding for traffic that matches these routes. Any additional IPv6 routes are software forwarded. (Routing performance to destination addresses on these networks may be impacted.) Use the **show capacities l3-resources** command to see the **maximum number of IPv6 routes with these prefix lengths** that can be configured in the ASIC. These prefixes are recommended for transit network use only.

Refer to **show capacities** in the ACLs and Classifiers Policy Guide to see the **maximum number of IPv6 routes with prefixes 65-127** that can be configured on the ASIC. Refer to **show capacities-status** in the ACLs and Classifiers Policy Guide to see the maximum number and current consumption.

This limited hardware support for long prefix IPv6 routes applies whether the routes are configured statically or learned dynamically.

## Examples

*On the 6400 Switch Series, interface identification differs.*

```
switch(config)# ipv6 route 120::/124 nullroute
switch(config)# ipv6 route 121::/124 nullroute
switch(config)# ipv6 route 122::/124 1/1/1
switch(config)# ipv6 route 122::/124 1/1/1.110
```

```
switch(config)# no ipv6 route 122::/124 1/1/1.110
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ipv6 route distance

```
ipv6 route <DEST-IPV6-ADDR>/<MASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>] distance <VALUE>
no ipv6 route <DEST-IPV6-ADDR>/<MASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>] distance <VALUE>
```

### Description

Configures the administrative distance for the IPv6 static route

The **no** form of this command deletes the static route.

| Parameter | Description |
|---|---|
| *<DEST-IPV6-ADDR>* | Specifies the route destination address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<MASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXT-HOP-IP-ADDR>* | Specifies the next hop in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<INTERFACE>* | Specifies the next hop as an outgoing interface. |
| distance *<VALUE>* | Specifies the administrative distance to associate with this static route. Range: 1 to 255. Default: 1. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

```
switch(config)# ipv6 route 122::/124 1/1/1 distance 5
switch(config)# ipv6 route 123::/124 120::1 distance 6
```

```
switch(config)# no ipv6 route 123::/124 120::1 distance 6
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ipv6 route tag

```
ipv6 route <DEST-IPV6-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> | reject
|
   nullroute} [tag] <1-4294967295>
no ipv6 route <DEST-IPV6-ADDR>/<NETMASK> {<NEXTHOP-ADDR> | <NEXTHOP-PORT-LAG-VLAN> |
   reject | nullroute} [tag] <1-4294967295>
```

### Description

Configures tag for IPv6 static route.

| Parameter | Description |
|---|---|
| *<DEST-IPV6-ADDR>* | Specifies the route destination in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<NETMASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXTHOP-ADDR>* | Specifies the next hop in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<NEXTHOP-PORT-LAG-VLAN>* | Specifies the next hop as an outgoing interface. |
| `reject` | Specifies that packets matching the destination route are discarded and an ICMP error notification is sent to the sender. |
| `nullroute` | Specifies that packets matching the destination route are silently discarded and no ICMP error notification is sent to the sender. |
| `tag` | Specifies and assigns tag for the route. |

### Examples

```
switch(config)# ipv6 route 3001::1/128 1/1/1 tag 10
switch(config)# ipv6 route 3002::1/128 1000::2 tag 20
switch(config)# no ipv6 route 3001::1/128 1/1/1 tag 10
switch(config)# no ipv6 route 3002::1/128 1000::2 tag 20
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## show ip rib

```
show ip rib <FILTER> [vrf <VRF-NAME>]
```

### Description

Shows the IPv4 Routing Information Base (RIB) of VRF with name (**<VRF-NAME>**). If VRF name is not specified, default VRF routes are displayed.

| Parameter | Description |
|---|---|
| *<FILTER>* | Selects filter, see Usage section. |
| vrf *<VRF-NAME>* | Specifies the VRF name. |

### Usage

There are sub-options available within this command:

- **A.B.C.D:** Shows longest prefix match.
- **A.B.C.D/M:** Shows exact route match.
- **all-vrfs:** Shows all VRF information.
- **bgp:** Shows BGP routes only.
- **connected:** Shows connected routes only.
- **connected:** Shows connected routes only.
- **local:** Shows local routes only.
- **ospf:** Shows OSPF routes only.
- **rip:** Shows RIP routes only.
- **static:** Shows static routes only.

- **summary:** Shows aggregate count of routes per routing protocol.
- **vrf:** Specifies the VRF name.
- **selected:** Shows routes selected for forwarding only.
- **non-selected:** Shows routes not selected for forwarding only.

The output of the **show ip rib** commands are not available in information generated by the **show tech files** command. This information is now available in the file ipv4_rib_dump.gz, which can be generated using the command **sudo ovs-appctl -t hpe-routing hpe-metaswitch/show_ip_rib ipv4 all-vrfs**.

## Examples

Showing IPv4 routes in RIB for 8325, 10000, 8360, and 9300 switch series:

```
switch# show ip rib
Origin Codes: R - RIP, O - OSPFv2, B - BGP
              C - connected, S - static, H - host-routes
Type Codes:   E - External BGP, I - Internal BGP, IA - OSPF inter area
              E1 - OSPF external type 1, E2 - OSPF external type 2
* indicates selected for forwarding

VRF: default

Prefix          Nexthop      Interface   VRF       Origin/ Distance/ Age
                                                       Type    Metric
----------------------------------------------------------------------------------
--
*1.1.1.1/32     -            1/1/33      -         H      [1/0]
00h:00m:07s
*10.0.0.0/30    -            1/1/1       -         S      [20/0]
0d:10h:01m:41s
*10.0.1.0/30    -            1/1/1       -         B/I    [200/0]
2d:20h:01m:42s
*10.1.64.0/18   -            loopback2   -         C      [0/0]      -
*10.2.64.0/18   10.0.0.3     lag1        -         O/E1   [110/25]
1d:05h:03m:43s
*10.2.64.0/18   20.10.0.1    vlan100     -         O/E1   [110/25]
0d:05h:03m:43s
*20.1.2.3/32    2.2.2.2      1/1/4       vrf_red   B/E    [20/0]
2d:10h:01m:45s
*30.1.3.0/24    -            reject      -         S      [1/0]
33d:10h:01m:43s
*50.10.13.0/24  -            reject      -         S      [1/0]
12d:10h:01m:44s
*61.1.1.2/32    4.4.4.4      1/1/5       -         B/I    [200/0]
1d:11h:01m:45s
*62.1.1.3/32    5.5.5.5      1/1/6       -         B/I    [200/0]
0d:12h:01m:45s
*193.0.0.2/32   50.0.0.2     1/1/2       -         S      [1/0]
0d:04h:01m:43s
 193.0.0.2/32   56.0.0.3     1/1/3       -         O/E1   [110/25]
0d:04h:03m:43s

Total Route Count : 14
```

Showing IPv4 routes in RIB for all other switches:

```
switch# show ip rib
Origin Codes: R - RIP, O - OSPFv2, B - BGP
              C - connected, S - static, D - DHCP
```

```
Type Codes:   E - External BGP, I - Internal BGP, IA - OSPF inter area
              E1 - OSPF external type 1, E2 - OSPF external type 2
* indicates selected for forwarding

VRF: default

Prefix          Nexthop      Interface   VRF       Origin/ Distance/ Age
                                                       Type    Metric
----------------------------------------------------------------------------------
--
*1.1.1.1/32     -            1/1/33      -         H      [1/0]
00h:00m:07s
*10.0.0.0/30    -            1/1/1       -         S      [20/0]
0d:10h:01m:41s
*10.0.1.0/30    -            1/1/1       -         B/I    [200/0]
2d:20h:01m:42s
*10.1.64.0/18   -            loopback2   -         C      [0/0]      -
*10.2.64.0/18   10.0.0.3     lag1        -         O/E1   [110/25]
1d:05h:03m:43s
*10.2.64.0/18   20.10.0.1    vlan100     -         O/E1   [110/25]
0d:05h:03m:43s
*20.1.2.3/32    2.2.2.2      1/1/4       vrf_red   B/E    [20/0]
2d:10h:01m:45s
*30.1.3.0/24    -            reject      -         S      [1/0]
33d:10h:01m:43s
*50.10.13.0/24  -            reject      -         S      [1/0]
12d:10h:01m:44s
*61.1.1.2/32    4.4.4.4      1/1/5       -         B/I    [200/0]
1d:11h:01m:45s
*62.1.1.3/32    5.5.5.5      1/1/6       -         B/I    [200/0]
0d:12h:01m:45s
*193.0.0.2/32   50.0.0.2     1/1/2       -         S      [1/0]
0d:04h:01m:43s
 193.0.0.2/32   56.0.0.3     1/1/3       -         O/E1   [110/25]
0d:04h:03m:43s

Total Route Count : 14
```

Showing IPv4 exact route match in RIB:

```
switch# show ip rib 10.0.0.0/30

VRF : default

Prefix          : 10.0.0.0/30            VRF(egress)        :  -
Nexthop         :  -                     Interface          :  1/1/1
Origin          : Connected              Type               :  -
Distance        : 0                      Metric             :  0
Age             : -                      Tag                :  0
Selected        : Yes                    Recursive Nexthop  :  No
```

Showing IPv4 RIB summary:

```
switch# show ip rib summary

IPv4 RIB Table Summary

VRF name :      default
  Protocol      RIB Routes
```

```
-------------- -------------
connected      1010
local          1011
static         4
ospfv2         509
bgp            9014
selected       10008
non-selected   1518
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

## show ipv6 rib

`show ipv6 rib <FILTER> [vrf <VRF-NAME>]`

### Description

Shows the IPv6 Routing Information Base (RIB) of VRF with name (**<VRF-NAME>**). If VRF name is not specified, default VRF routes are displayed.

| Parameter | Description |
|---|---|
| *<FILTER>* | Selects filter, see usage section. |
| vrf *<VRF-NAME>* | Shows routes in the VRF and specifies VRF name. |

### Usage

There are sub-options available within this command:

- **X:X: :X:X:** Shows longest prefix match.
- **X:X: :X:X/M:** Shows exact route match.
- **all-vrfs:** Shows all VRF information.
- **bgp:** Shows BGP routes only.
- **connected:** Shows connected routes only.
- **local:** Shows local routes only.

- **ospf:** Shows OSPF routes only.
- **rip:** Shows RIP routes only.
- **static:** Shows static routes only.
- **summary:** Shows aggregate count of routes per routing protocol.
- **vrf:** Specifies the VRF name.
- **selected:** Shows routes selected for forwarding only.
- **non-selected:** Shows routes not selected for forwarding only.

## Examples

Showing IPv6 routes in RIB for 8325, 10000, 8360, and 9300 switch series:

```
switch# show ipv6 rib
Origin Codes: R - RIPng, O - OSPFv3, B - BGP
              C - connected, S - static, H - host-routes
Type Codes:   E - External BGP, I - Internal BGP, IA - OSPF inter area
              E1 - OSPF external type 1, E2 - OSPF external type 2
* indicates selected for forwarding

VRF: default

Prefix               Nexthop     Interface  VRF    Origin/ Distance/ Age
                                                       Type    Metric
----------------------------------------------------------------------------------
--
*1::2/128            1::2        1/1/1      -      H      [1/0]        00h:00m:06s
*1000::/64           -           1/1/1      -      C      [0/0]     -
*1000::8/128         -           1/1/1      -      L      [0/0]     -
*1001:db8::/32       1000::10    1/1/1      -      B/I    [200/0]   1d:20h:01m:42s
*2000::/64           fe80::3182  vlan100    -      S      [1/0]     2d:05h:03m:43s
 2000::/64           fe80::1241  1/1/1      -      O/E1   [110/25]  0d:05h:03m:43s
*2000::2000:0:0:0/67 fe80::1111  lag1       Green  B/E    [20/0]    1d:10h:01m:45s
*3001::0/64          -           vlan100    -      C      [0/0]     -
*3001::1/128         -           vlan100    -      L      [0/0]     -
*6101::0/64          -           nullroute  -      S      [1/0]
12d:10h:01m:43s

Total Route Count : 10
```

Showing IPv6 routes in RIB for the other switch series:

```
switch# show ipv6 rib
Origin Codes: R - RIPng, O - OSPFv3, B - BGP
              C - connected, S - static, D- DHCP
Type Codes:   E - External BGP, I - Internal BGP, IA - OSPF inter area
              E1 - OSPF external type 1, E2 - OSPF external type 2
* indicates selected for forwarding

VRF: default

Prefix               Nexthop     Interface  VRF    Origin/ Distance/ Age
                                                       Type    Metric
----------------------------------------------------------------------------------
--
*1000::/64           -           1/1/1      -      C      [0/0]     -
*1000::8/128         -           1/1/1      -      L      [0/0]     -
*1001:db8::/32       1000::10    1/1/1      -      B/I    [200/0]   1d:20h:01m:42s
```

```
*2000::/64           fe80::3182  vlan100    -      S      [1/0]      2d:05h:03m:43s
 2000::/64           fe80::1241  1/1/1      -      O/E1   [110/25]   0d:05h:03m:43s
*2000::2000:0:0:0/67 fe80::1111  lag1       Green  B/E    [20/0]     1d:10h:01m:45s
*3001::0/64          -           vlan100    -      C      [0/0]      -
*3001::1/128         -           vlan100    -      L      [0/0]      -
*6101::0/64          -           nullroute  -      S      [1/0]
12d:10h:01m:43s

Total Route Count : 10
```

Showing IPv6 exact route match in RIB:

```
switch# show ipv6 rib 2000::2000:0:0:0

VRF : default

Prefix           : 2000::2000:0:0:0/67         VRF(egress)        :  Green
Nexthop          : fe80::1111                  Interface          :  lag1
Origin           : BGP                         Type               :  External
Distance         : 20                          Metric             :  0
Age              : 1d:10h:01m:45s              Tag                :  20
Selected         : Yes                         Recursive Nexthop  :  Yes
```

Showing IPv6 RIB summary:

```
switch# show ipv6 rib summary

IPv6 RIB Table Summary

VRF name :  default
  Protocol       RIB Routes
-------------- -------------
connected      1009
local          1010
static         3
ospfv3         508
bgp            1013

selected       10004
non-selected   1527
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# ipv6 route vrf

```
ipv6 route <DEST-IPV6-ADDR>/<PREFIX> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
vrf <VRF-NAME>
no ipv6 route <DEST-IPV6-ADDR>/<PREFIX> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
vrf <VRF-NAME>
```

## Description

Adds an IPv6 static route in the specified VRF. If no *<VRF-NAME>* is specified it is added to the default VRF.

The **no** form of this command removes an IPv6 static route from the VRF.

| Parameter | Description |
|---|---|
| *<DEST-IPV6-ADDR>* | Specifies an IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<MASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXT-HOP-IP-ADDR>* | Specifies the next hop in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<INTERFACE>* | Specifies the next hop as an outgoing interface. |
| nullroute | Specifies that packets matching the destination prefix are silently discarded and no ICMP error notification is sent to the sender. |
| reject | Specifies that packets matching the destination prefix are discarded and an ICMP error notification is sent to the sender. |
| vrf *<VRF-NAME>* | Specifies the name of a VRF. Default: default. |

## Examples

```
switch(config)# ipv6 route 120::/124 121::2 vrf test
switch(config)# ipv6 route 121::/124 1/1/9 vrf test
switch(config)# ipv6 route 122::/124 nullroute vrf test
switch(config)# ipv6 route 123::/124 reject vrf test
```

```
switch(config)# no ipv6 route 120::/124 121::2 vrf test
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## show ip route

```
show ip route [<A.B.C.D> | <A.B.C.D/M> | all-vrfs | bgp | connected | local | ospf |
static | summary | vrf <VRF-NAME>] [vsx-peer]
```

### Description

Displays IPv4 route tables.

| Parameter | Description |
|---|---|
| **`<A.B.C.D>`** | Display longest prefix match. |
| **`<A.B.C.D/M>`** | Display exact route match. |
| `all-vrfs` | Display information for all VRFs. |
| `bgp` | Display bgp routes only. |
| `connected` | Display connected routes only. |
| `local` | Display local routes only. |
| `ospf` | Display ospf routes only. |
| `static` | Display static routes only. |
| `summary` | Display the aggregate count of routes per routing protocol. |
| `vrf` *`<vrf-name>`* | Specify a VRF by VRF name (if no <*VRF-NAME*> is specified, the default VRF is implied. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing IPv4 route tables:

```
switch# show ip route

Displaying ipv4 routes selected for forwarding

'[x/y]' denotes [distance/metric]
10.0.0.0/24, vrf default
     via  vlan2,  [0/0],  connected
10.0.0.1/32, vrf default
     via  vlan2,  [0/0],  local
10.100.11.0/24, vrf default
     via  vlan1,  [0/0],  connected
10.100.11.82/32, vrf default
     via  vlan1,  [0/0],  local
20.0.0.0/24, vrf default
     via  10.0.0.2,  [1/0],  static
20.0.1.0/24, vrf default
     via  10.0.0.2,  [1/0],  static
20.0.2.0/24, vrf default
     via  vlan1,  [1/0],  static
20.0.4.0/24, vrf default
     nullroute,  [1/0],  static
20.0.5.0/24, vrf default
     reject route,  [1/0],  static
```

Showing IPv4 route tables for the test VRF:

```
switch# show ip route vrf test

Displaying ipv4 routes selected for forwarding

'[x/y]' denotes [distance/metric]

30.0.0.0/24,  1 (nullroute) next-hops
       via  30.0.0.2,  [0/0],  connected
90.0.0.0/24,  1 unicast next-hops
       via  30.0.0.1,  [1/0],  static
90.0.1.0/24,  1 unicast next-hops
       via  1/1/2,  [1/0],  static
90.0.3.0/24, nullroute, 1, [1/0], static
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show ipv6 route

```
show ipv6 route [<X.X.X.X> | <X.X.X.X/M> | all-vrfs | bgp | connected | local | ospf |
static | summary | vrf <vrf-name>] [vsx-peer]
```

## Description

Displays IPv6 route tables.

| Parameter | Description |
|---|---|
| **`<X.X.X.X>`** | Display exact route match. |
| **`<X.X.X.X/M>`** | Display exact route match. |
| `all-vrfs` | Display information for all VRFs. |
| `bgp` | Display bgp routes only. |
| `connected` | Display connected routes only. |
| `local` | Display local routes only. |
| `ospf` | Display ospf routes only. |
| `static` | Display static routes only. |
| `summary` | Display the aggregate count of routes per routing protocol. |
| `vrf` *`<vrf-name>`* | Specify a VRF by VRF name (if no <*VRF-NAME*> is specified, the default VRF is implied. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

Showing IPv6 route tables:

```
switch# show ipv6 route

Displaying ipv6 routes selected for forwarding

'[x/y]' denotes [distance/metric]

1000::/64, vrf default
        via  vlan2,  [0/0],  connected
1000::1/128, vrf default
        via  vlan2,  [0/0],  local
2000::/64, vrf default
        via  vlan2,  [1/0],  static
2001::/64, vrf default
        via  1000::2,  [1/0],  static
3000:2301::/64, vrf default
        nullroute,  [1/0],  static
4000:2301::/64, vrf default
        reject route,  [1/0],  static
```

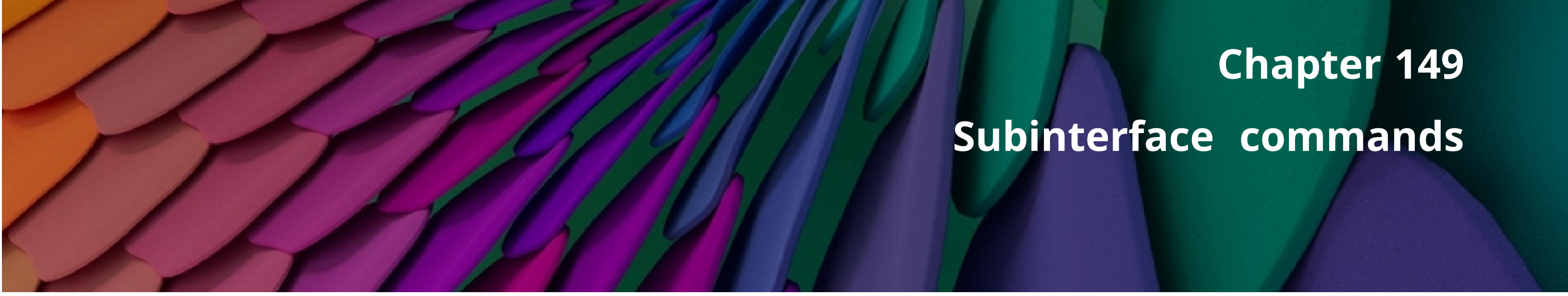
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |



# Chapter 149
# Subinterface commands

## encapsulation dot1q

```
encapsulation dot1q <VLAN-ID>
no encapsulation dot1q <VLAN-ID>
```

### Description

Configures 802.1Q encapsulation on a subinterface.

The **no** form of this command removes 802.1Q encapsulation on a subinterface.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies encapsulation VLAN ID.<br>Range 1 to 4094.<br>**NOTE:** The encapsulation VLAN ID should be unique within an L3 LAG subinterface. The same encapsulation VLAN ID can be configured among different parent interfaces, but the encapsulation VLAN ID should not be configured in the internal VLAN range. (Encapsulation VLAN IDs and static VLANs are entirely different and do not coincide.) |

### Usage

Associates an 802.1Q VLAN ID with a subinterface.

### Examples

Configuring 802.1Q encapsulation on a subinterface:

```
switch(config)# interface 1/1/1.201
switch(config-subif)# encapsulation dot1q 10
```

Removing 802.1Q encapsulation on a subinterface:

```
switch(config-subif)# no encapsulation dot1q 10
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced for the 6300, 6400switch series. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-subif` | Administrators or local user group members with execution rights for this command. |

## interface

```
interface <IFNAME>.<ID>
no interface <IFNAME>.<ID>

interface lag <LAGNUM>.<ID>
no interface lag <LAGNUM>.<ID>
```

### Description

Creates a subinterface on an L3 interface and enters subinterface configuration mode. The subinterface name consists of the parent interface name (for example, 1/1/1) followed by a period and a unique ID number.

The **no** form of these commands deletes a subinterface from an L3 interface.

| Parameter | Description |
|---|---|
| *<IFNAME>* | Specifies L3 interface name. |
| *<ID>* | Specifies subinterface ID. Range 1 to 4094. |
| *<LAGNUM>* | Specifies L3 LAG interface number. |

### Usage

To create a LAG subinterface, the parent LAG must exist before creating the subinterface.

### Examples

Creating a subinterface on L3 interface 1/1/1.201 and entering subinterface configuration mode:

```
switch(config)# interface 1/1/1.201
switch(config-subif)#
```

Deleting subinterface on L3 interface 1/1/1.201:

```
switch(config)# no interface 1/1/1.201
```

Creating a subinterface on an L3 LAG port and entering subinterface configuration mode:

```
switch(config)# interface lag 1
switch(config-if)# interface lag 1.201
switch(config-subif)#
```

Deleting subinterface on an L3 LAG port :

```
switch(config)# no interface lag 1.201
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced for the 6300, 6400 switch series. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## show capacities subinterface

`show capacities subinterface`

### Description

Displays maximum subinterface capacity.

### Examples

Showing maximum subinterface capacity:

```
switch# show capacities subinterface

System Capacities: Filter Subinterface
Capacities Name
Value
---------------------------------------------------------------------------------
-
Maximum number of LAG subinterfaces for the entire system
256
Maximum number of LAG members when the LAG has subinterfaces
4
Maximum number of normal subinterfaces for the entire system
1024
Maximum number of subinterface resources for the entire system (normal+(4*LAG)
1024
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced for the 6300, 6400 switch series. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show interface

```
show interface <IFNAME>.<ID>
show interface lag <LAGNUM>.<ID>
```

### Description

Displays a subinterface configuration.

| Parameter | Description |
|---|---|
| *<IFNAME>* | Specifies L3 interface name. |
| *<ID>* | Specifies subinterface ID. |
| *<LAGNUM>* | Specifies L3 LAG interface number. |

### Examples

Showing subinterface configuration:

```
switch# show interface 1/1/1.201
Interface 1/1/1.201 is down
Admin state is up
State information: Waiting for link
Description:
Hardware: Ethernet, MAC Address: 38:21:c7:5a:80:80
Encapsulation dot1Q ID: 10
Statistic                          RX                   TX                Total
---------------- -------------------- -------------------- --------------------
L3 Packets                          0                    0                    0
L3 Bytes                            0                    0                    0
```

Showing subinterface LAG configuration:

```
switch# show interface lag1.1
Interface lag1.1 is down
Admin state is up
Description:
Hardware: Ethernet, MAC Address: 38:21:c7:5a:80:80
Encapsulation dot1Q ID: 2
Statistic                                 RX                   TX                Total
---------------- -------------------- -------------------- --------------------
L3 Packets                                 0                    0                    0
L3 Bytes                                   0                    0                    0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced for the 6300, 6400 switch series. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

# Chapter 150

# Supportability copy commands

## copy checkpoint

```
copy checkpoint <CHECKPOINT-NAME> {<STORAGE-URL> | <REMOTE-URL>}
```

### Description

Copies the checkpoint using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<CHECKPOINT-NAME>* | Specifies the checkpoint name. |
| {*<STORAGE-URL>* \| *<REMOTE-URL>*} | Select either the storage URL or the remote URL for the destination of the copied command output. Required. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax:<br>**{usb}:/*<FILE>*** |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |

### Examples

Copying checkpoint chpt to a remote URL:

```
switch# copy checkpoint chpt scp://root@10.0.1.1/config vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

# copy command-output

```
copy command-output "<COMMAND>" {<STORAGE-URL> | <REMOTE-URL> [vrf <VRF-NAME>]}
```

## Description

Copies the specified command output using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<COMMAND>* | Specifies the command from which you want to obtain its output. Required. Users with auditor rights can specify these two commands only:<br>**show accounting log**<br>**show events** |
| {*<STORAGE-URL>* \| *<REMOTE-URL>* [vrf *<VRF-NAME>*]} | Select either the storage URL or the remote URL for the destination of the copied command output. Required. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax:<br>**{usb}:/*<FILE>*** |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| vrf *<VRF-NAME>* | Specifies the VRF name. The default VRF name is default. Optional. |

## Examples

Copying the output from the **show events** command to a remote URL:

```
switch# copy command-output "show events" tftp://10.100.0.12/file
```

Copying the output from the **show tech** command to a remote URL with a VRF named *mgmt*:

```
switch# copy command-output "show tech" scp://user@10.100.0.12/file vrf mgmt
```

Copying the output from the **show tech** command to a remote URL with a VRF named *mgmt*:

```
switch# copy command-output "show tech" tftp://10.100.0.12/file vrf mgmt
```

Copying the output from the **show events** command to a file named **events** on a USB drive:

```
switch# copy command-output "show events" usb:/events
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## copy core-dump [<MEMBER/SLOT>] daemon

```
copy core-dump [<MEMBER/SLOT>] daemon <DAEMON-NAME>[:<INSTANCE-ID>] <REMOTE-URL> [vrf
<VRF-NAME>]
```

### Description

Copies the core-dump from the specified daemon using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<MEMBER/SLOT>* | Specifies the slot ID on an 8400 or 6400 switch. Required.<br>Syntax: Slot number for line (**1/1-1/4**, **1/7-1/10**) MM(**1/5** or **1/6**) |
| *<DAEMON-NAME>* | Specifies the name of the daemon. Required. |
| [:*<INSTANCE-ID>*] | Specifies the instance of the daemon core dump. Optional. |
| *<REMOTE_URL>* | Specifies the remote destination URL. Required. The syntax of the URL is the following:<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| vrf *<VRF-NAME>* | Specifies the VRF name. If no VRF name is provided, the VRF named *default* is used. Optional. |

### Examples

Copying the core dump from daemon **ops-vland** to a remote URL with a VRF named **mgmt**:

```
switch# copy core-dump daemon ops-vland sftp://abc@10.0.14.211/vland_coredump.xz
vrf mgmt
```

Copying the core dump from daemon **ops-vland** to a remote URL with a VRF named **mgmt**:

```
switch# copy core-dump daemon ops-vland scp://abc@10.0.14.211/vland_coredump.xz
vrf mgmt
```

Copying the core dump from daemon **ops-switchd** to a USB drive:

```
switch# copy core-dump daemon ops-switchd usb:/switchd
```

Copying the core dump with slot ID 1/1 from daemon **hpe-sysmond** to a remote URL:

```
switch# copy core-dump 1/1 daemon hpe-sysmond sftp://abc@10.0.14.206/core.hpe-
sysmond.xz vrf mgmt
```

Copying the core dump from the **hpe-config** process to a USB drive:

```
switch# copy core-dump daemon hpe-config usb:/config_core
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy core-dump [<MEMBER/SLOT>] kernel

```
copy core-dump [<MEMBER/SLOT>] kernel <REMOTE-URL> [vrf <VRF-NAME>]
```

### Description

Copies a kernel core dump using TFTP, SFTP, or SCP.

| Parameter | Description |
|---|---|
| *<MEMBER/SLOT>* | Specifies the slot ID on an 8400 or 6400 switch. Required.<br>Syntax: Slot number for line (**1/1-1/4**, **1/7-1/10**) MM(**1/5** or **1/6**) |
| *<REMOTE-URL>* | Specifies the URL to copy the command output. Required.<br>Syntax:<br>▪ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>▪ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| vrf *<VRF-NAME>* | Specifies the VRF name. The default VRF name is default. Optional. |

### Examples

Copying the kernel core dump to the URL:

```
switch# copy core-dump kernel tftp://10.100.0.12/kernel_dump.tar.gz
```

Copying the kernel core dump to the URL with the VRF named mgmt:

```
switch# copy core-dump kernel tftp://10.100.0.12/kernel_dump.tar.gz vrf mgmt
```

Copying the kernel core dump from slot ID 1/1 to the URL with the VRF named mgmt:

```
switch# copy core-dump 1/1 kernel sftp://abc@10.0.14.206/kernel_dump.tar.gz vrf
mgmt
```

Copying the kernel core dump from slot ID 1/1 to the URL with the VRF named mgmt:

```
switch# copy core-dump 1/1 kernel scp://abc@10.0.14.206/kernel_dump.tar.gz vrf
mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy core-dump [<MEMBER/SLOT>] kernel *<STORAGE-URL>*

```
copy core-dump [<MEMBER/SLOT>] kernel <STORAGE-URL>
```

### Description

Copies the kernel core dump to a USB drive.

| Parameter | Description |
|---|---|
| *<MEMBER/SLOT>* | Specifies the slot ID. Required.<br>Syntax: Slot number for line (**1/1-1/4**, **1/7-1/10**) MM(**1/5** or **1/6**) |
| *<STORAGE-URL>* | Specifies the USB to copy command output. Required.<br>Syntax: **{usb]:/*<FILE>*** |

### Examples

Copying the kernel core dump to a USB drive:

```
switch# copy core-dump kernel usb:/kernel.tar.gz
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy core-dump vsf member daemon

Applicable for 6300 switches only.

```
copy core-dump vsf member <MEMBER-ID>
     daemon [<DAEMON-NAME> | <DAEMON-NAME>:<INSTANCE-ID>]
<REMOTE-URL> [vrf <VRF-NAME>]
copy core-dump vsf member <MEMBER-ID>
     daemon [<DAEMON-NAME> | <DAEMON-NAME>:<INSTANCE-ID>]
<STORAGE-URL>
```

### Description

Copies the core-dump from the specified daemon using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| `vsf member` *`<MEMBER-ID>`* | Specifies the member-id of the VSF member. Required. |
| *`<DAEMON-NAME>`* | Specifies the name of the daemon. Required. |
| `[:`*`<INSTANCE-ID>`*`]` | Specifies the instance of the daemon core dump. Optional. |
| *`<REMOTE_URL>`* | Specifies the remote destination URL. Required. The syntax of the URL is the following:<br>Syntax:<br>■ **{tftp://}{<*IP*> \| <*HOST*>}[:<*PORT*>][;blocksize=<*VAL*>]/<*FILE*>**<br>■ **{sftp:// \| scp:// <*USER*>@}{<*IP*> \| <*HOST*>}[:<*PORT*>]/<*FILE*>** |
| `vrf` *`<VRF-NAME>`* | Specifies the VRF name. If no VRF name is provided, the VRF named *default* is used. Optional. |
| *`<STORAGE-URL>`* | Specifies the USB to copy command output. Required.<br>Syntax: **{usb}:/<*FILE*>** |

## Examples

Copying the core dump from daemon hpe-sysmond to a remote URL with a VRF named mgmt:

```
switch# copy core-dump vsf member 1 daemon hpe-sysmond
sftp://abc@10.0.14.206/sysmon.xz vrf mgmt
```

Copying the core dump from daemon hpe-sysmond to a remote URL with a VRF named mgmt:

```
switch# copy core-dump vsf member 2 daemon hpe-sysmond
scp://user@10.0.14.206/sysmon.xz vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy core-dump vsf member kernel

Applicable for 6300 switches only.

```
copy core-dump vsf member <MEMBER-ID> kernel <REMOTE-URL> [vrf <VRF-NAME>]
copy core-dump vsf member <MEMBER-ID> kernel <STORAGE-URL>
```

## Description

Copies the kernel core-dump using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | Specifies the member-id of the VSF member. Required. |
| *<REMOTE_URL>* | Specifies the remote destination URL. Required. The syntax of the URL is the following:<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| `vrf` *<VRF-NAME>* | Specifies the VRF name. If no VRF name is provided, the VRF named *default* is used. Optional. |
| *<STORAGE-URL>* | Specifies the USB to copy command output. Required.<br>Syntax: **{usb}:/*<FILE>*** |

## Examples

Copying the kernel core dump to the URL with a VRF named mgmt:

```
switch# copy core-dump vsf member 3 kernel sftp://abc@10.0.14.206/kernel.tar.gz
vrf mgmt
```

Copying the kernel core dump to the URL with a VRF named mgmt:

```
switch# copy core-dump vsf member 3 kernel scp://abc@10.0.14.206/kernel.tar.gz vrf
mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## copy diag-dump feature *<FEATURE>*

`copy diag-dump feature <FEATURE> {<REMOTE-URL> [vrf <VRF-NAME>] | <STORAGE-URL>}`

### Description

Copies the specified diagnostic information using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| `<FEATURE>` | The name of a feature, for example **aaa or vrrp**. Required. |
| `{<REMOTE-URL> [vrf <VRF-NAME> \|<STORAGE-URL>]}` | Select either the remote URL or the storage URL for the destination of the copied command output. Required. |
| `<REMOTE-URL>` | Specifies the remote destination URL. Required. The syntax of the URL is the following:<br>Syntax:<br>- **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*] [;blocksize=*<VAL>*]/*<FILE>***<br>- **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*} [:*<PORT>*]/*<FILE>*** |
| `vrf <VRF-NAME>` | Specifies the VRF name. If no VRF name is provided, the VRF named *default* is used. Optional. |
| `<STORAGE-URL>` | Specifies the USB to copy command output. Required.<br>Syntax: `{usb}:/<FILE>` |

### Examples

Copying the output from the aaa feature to a remote URL with a specified VRF:

```
switch# copy diag-dump feature aaa tftp://10.100.0.12/diagdump.txt vrf mgmt
```

Copying the output from the aaa feature to a remote URL with a specified VRF:

```
switch# copy diag-dump feature aaa scp://user@10.100.0.12/diagdump.txt vrf mgmt
```

Copying the output from the vrrp feature to a USB drive:

```
switch# copy diag-dump feature vrrp usb:/diagdump.txt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## copy diag-dump local-file

```
copy diag-dump local-file {<REMOTE-URL> [vrf <VRF-NAME>] | <STORAGE-URL>}
```

### Description

Copies the diagnostic information stored in a local file using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| `{<REMOTE-URL> [vrf <VRF-NAME>] \|<STORAGE-URL>}` | Select either the storage URL or the remote URL for the destination of the copied command output. Required. |
| `<REMOTE-URL>` | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*] [;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*} [:*<PORT>*]/*<FILE>*** |
| `vrf <VRF-NAME>` | Specifies the VRF name. The default VRF name is default. Optional. |
| `<STORAGE-URL>` | Specifies the USB to copy command output.<br>Syntax: **{usb}:/*<FILE>*** |

### Usage

The **copy diag-dump local-file** command can be used only after the information is captured. Run the **diag-dump *<FEATURE-NAME>* basic local-file** command before you enter the **copy diag-dump local-file** command to capture the diagnostic information for the specified feature into the local file.

### Examples

Copying the output from the local file to a remote URL:

```
switch# diag-dump aaa basic local-file
switch# copy diag-dump local-file tftp://10.100.0.12/diagdump.txt
```

Copying the output from the local file to a remote URL:

```
switch# diag-dump aaa basic local-file
switch# copy diag-dump local-file scp://user@10.100.0.12/diagdump.txt
```

Copying the output from the local file to a USB drive:

```
switch# diag-dump aaa basic local-file
switch# copy diag-dump local-file usb:/diagdump.txt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy diag-dump vsf member local-file

Applicable for 6300 switches only.

```
copy diag-dump vsf member <MEMBER-ID> local-file {<REMOTE-URL> [vrf <VRF-NAME>] |
<STORAGE-URL>}
```

### Description

Copies the diagnostic information stored in a local file using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| `vsf member <MEMBER-ID>` | Specifies the member-id of the VSF member. Required. |
| `{<REMOTE-URL> [vrf <VRF-NAME>] \|<STORAGE-URL>}` | Select either the storage URL or the remote |

| Parameter | Description |
|---|---|
| | URL for the destination of the copied command output. Required. |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ {tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>*<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| vrf *<VRF-NAME>* | Specifies the VRF name. The default VRF name is default. Optional. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax: **{usb}:/*<FILE>*** |

## Usage

The **copy diag-dump local-file** command can be used only after the information is captured. Run the **diag-dump *<FEATURE-NAME>* basic local-file** command before you enter the **copy diag-dump local-file** command to capture the diagnostic information for the specified feature into the local file.

## Examples

Copying the output from the local file to a remote URL:

```
switch# diag-dump aaa basic local-file
switch# copy diag-dump vsf member 2 local-file scp://user@10.100.0.12/diagdump.txt
```

Copying the output from the local file to a remote URL:

```
switch# diag-dump aaa basic local-file
switch# copy diag-dump vsf member 2 local-file tftp://10.100.0.12/diagdump.txt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy *<IMAGE>*

```
copy <IMAGE> {<STORAGE-URL> | <REMOTE-URL>} <FILE-NAME> [vrf <VRF-NAME>]
```

## Description

Copies the image using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<IMAGE>* | Specifies the image. |
| {*<STORAGE-URL>* \| *<REMOTE-URL>*} | Select either the storage URL or the remote URL for the destination of the copied command output. Required. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax:<br>**{usb}:/*<FILE>*** |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| *<FILE-NAME>* | Specifies the file name. |
| vrf *<VRF-NAME>* | Specifies the VRF name. The default VRF name is default. Optional. |

## Examples

Copying the image to a remote URL:

```
switch# copy scp://root@20.0.1.1/primary.swi primary vrf mgmt
```

Copying the secondary image to a remote URL:

```
switch# copy secondary scp://root@20.0.1.1/primary.swi vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## copy running-config

```
copy running-config {<STORAGE-URL> | <REMOTE-URL>}/config <CONFIG-NAME> [vrf <VRF-NAME>]
```

### Description

Copies the running configuration using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| `{<STORAGE-URL> | <REMOTE-URL>}` | Select either the storage URL or the remote URL for the destination of the copied command output. Required. |
| `<STORAGE-URL>` | Specifies the USB to copy command output.<br>Syntax:<br>**{usb}:/*<FILE>*** |
| `<REMOTE-URL>` | Specifies the URL to copy the command output.<br>Syntax:<br>■ `{tftp://}{<IP> | <HOST>}[:<PORT>][;blocksize=<VAL>]/<FILE>`<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| `config <CONFIG-NAME>` | Specifies the running configuration. |
| `vrf <VRF-NAME>` | Specifies the VRF name. The default VRF name is default. Optional. |

### Examples

Copying the running configuration to a remote URL:

```
switch# copy running-config scp://root@10.0.1.1/config cli vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## copy show-tech feature

`copy show-tech feature <FEATURE> {<REMOTE-URL> [vrf <VRF-NAME>] | <STORAGE-URL>}`

### Description

Copies show tech output using TFTP, SFTP, SCP, and USB.

| Parameter | Description |
|---|---|
| `{<REMOTE-URL> [vrf <VRF-NAME> | <STORAGE-URL>]}` | Select either the remote URL or the storage URL for the destination of the copied command output. Required. |
| `<REMOTE-URL>` | Specifies the URL to copy the command output. Required.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*] [;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| `vrf <VRF-NAME>` | Specifies the VRF name. The default VRF name is default. Optional. |
| `<STORAGE-URL>` | Specifies the USB to copy command output. Required.<br>Syntax: **{usb}:/*<FILE>*** |

### Example

Copying show tech output of the **aaa** feature using SCP:

```
switch# copy show-tech feature aaa scp://user@10.0.0.12/file.txt vrf mgmt
```

Copying show tech output of the `config` feature using SFTP on the `mgmt` VRF:

```
switch# copy show-tech feature config sftp://root@10.0.0.1/tech.txt vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## copy show-tech local-file

`copy show-tech local-file {<REMOTE-URL> [vrf <VRF-NAME>] | <STORAGE-URL>}`

### Description

Copies show tech output stored in a local file.

| Parameter | Description |
|---|---|
| `{<REMOTE-URL> [vrf <VRF-NAME>] \| <STORAGE-URL> ]}` | Select either the remote URL or the storage URL for the destination of the copied command output. Required. |
| `<REMOTE-URL>` | Specifies the URL to copy the command output.<br>Syntax:<br>▪ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>▪ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| `vrf <VRF-NAME>` | Specifies the VRF name. The default VRF name is default. Optional. |
| `<STORAGE-URL>` | Specifies the USB to copy command output.<br>Syntax: **{usb}:/*<FILE>*** |

### Usage

Before entering the **copy show-tech local-file** command, run the **show tech** command with the **local-file** parameter for the specified feature.

### Examples

Copying the output to a remote URL:

```
switch# copy show-tech local-file tftp://10.100.0.12/file.txt
```

Copying the output to a remote URL:

```
switch# copy show-tech local-file scp://user@10.100.0.12/file.txt
```

Copying the output to a remote URL with a VRF:

```
switch# copy show-tech local-file tftp://10.100.0.12/file.txt vrf mgmt
```

Copying the output to a USB:

```
switch# copy show-tech local-file usb:/file
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## copy show-tech vsf member local-file

Applicable for 6300 switches only.

```
copy show-tech vsf member <MEMBER-ID> local-file {<REMOTE-URL> [vrf <VRF-NAME>] |
<STORAGE-URL>}
```

### Description

Copies show tech output stored in a local file.

| Parameter | Description |
|---|---|
| `vsf member <MEMBER-ID>` | Specifies the member-id of the VSF |

| Parameter | Description |
|---|---|
| | member. Required. |
| `{<REMOTE-URL> [vrf <VRF-NAME>] \| <STORAGE-URL> ]}` | Select either the remote URL or the storage URL for the destination of the copied command output. Required. |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*] [;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| `vrf <VRF-NAME>` | Specifies the VRF name. The default VRF name is default. Optional. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax: **{usb}:/*<FILE>*** |

## Usage

Before entering the `copy show-tech local-file` command, run the `show tech` command with the `local-file` parameter for the specified feature.

## Examples

Copying the output to a remote URL with a VRF:

```
switch# copy show-tech vsf member 2 local-file tftp://10.100.0.12/showtech.txt vrf
mgmt
```

Copying the output to a USB:

```
switch# copy show-tech vsf member 2 local-file usb:/file
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy startup-config

`copy startup-config {<STORAGE-URL> | <REMOTE-URL>}/config <CONFIG-NAME> [vrf <VRF-NAME>]`

## Description

Copies the running configuration using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| `{<STORAGE-URL> | <REMOTE-URL>}` | Select either the storage URL or the remote URL for the destination of the copied command output. Required. |
| `<STORAGE-URL>` | Specifies the USB to copy command output.<br>Syntax:<br>**{usb}:/*<FILE>*** |
| `<REMOTE-URL>` | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*][;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| `config <CONFIG-NAME>` | Specifies the startup configuration. |
| `vrf <VRF-NAME>` | Specifies the VRF name. The default VRF name is default. Optional. |

## Examples

Copying the startup configuration to a remote URL:

```
switch# copy startup-config scp://root@10.0.1.1/config json vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

# copy support-files

```
copy support-files
   <REMOTE-URL> [vrf <VRF-NAME>]
   <STORAGE-URL>
   all <REMOTE-URL> [vrf <VRF-NAME>]
   all <STORAGE-URL>
   feature <FEATURE-NAME> <STORAGE-URL>
   previous-boot <REMOTE-URL> [vrf <VRF-NAME>]
   previous-boot <STORAGE-URL>
```

For the 6400 switch only:

```
   module <SLOT-ID> <REMOTE-URL> [vrf <VRF-NAME>]
   module <SLOT-ID> <STORAGE-URL>
   standby <REMOTE-URL> [vrf <VRF-NAME>]
```

For the 6300 switch only:

```
   vsf member <MEMBER-ID> <REMOTE-URL> {vrf <VRF-NAME>}
   vsf member <MEMBER-ID> <STORAGE-URL>
```

## Description

Copies a set of support files to a compressed file in tar.gz format using TFTP, SFTP, SCP, or USB or to a directory over SFTP or USB.

This command does not support TFTP transfer on 6300 switches.

| Parameter | Description |
|---|---|
| *<FEATURE-NAME>* | The feature name, for example, `aaa`. |
| {*<REMOTE-URL>* [vrf *<VRF-NAME>*] \| *<STORAGE-URL>* ]} | Select either the remote URL or the storage URL for the destination of the copied command output. Required. |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*] [;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| vrf *<VRF-NAME>* | Specifies the VRF name. The default VRF name is default. Optional. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax: **{usb}:/*<FILE>*** |

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | The member ID in the VSF stack. Range 1-10. |
| *<SLOT-ID>* | Specifies the slot ID on 6400 switches. Optional.<br>Syntax: Slot number for line (**1/1-1/4**, **1/7-1/10**) MM(**1/5** or **1/6**) |

### Usage

If feature name is not provided, the command collects generic system-specific support information. If a feature name is provided, the command collects feature-specific support information.

In order to collect data from standby and member in a VSF stack, the command will prompt for the local user password once.

In order to collect data from the standby 6400 swtich, the command will prompt for the local user password once.

### Examples

Copying the support files to a remote URL:

```
switch# copy support-files tftp://10.100.0.12/file.tar.gz
```

Copying the support files of the **lldp** feature to a remote URL with a specified VRF:

```
switch# copy support-files feature lldp tftp://10.100.0.12/file.tar.gz vrf mgmt
```

Copying the support files from the previous boot to a remote URL with a specified VRF:

```
switch# copy support-files previous-boot scp://user@10.0.14.206/file.tar.gz vrf
mgmt
```

Copying the support files to a USB:

```
switch# copy support-files usb:/file.tar.gz
```

Copying the files from a module to a remote URL with a specified VRF on an 8400 or 6400 switch:

```
switch# copy support-files module 1/1 tftp://10.100.0.12/file.tar.gz vrf mgmt
```

Copying the files from a standby module to a remote URL with a specified VRF on an 8400 or 6400 switch:

```
switch# copy support-files standby sftp://root@10.0.14.216/file.tar.gz vrf mgmt
```

Copying all the support files to a remote URL:

```
switch# copy support-files all sftp://root@10.0.14.216/file.tar.gz vrf mgmt
```

Copying the support files of the `config` feature to a USB:

```
switch# copy support-files feature config usb:/file.tar.gz
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## copy support-files local-file

```
copy support-files [feature <FEATURE-NAME> | previous-boot | all | module <SLOT-ID> |
standby | vsf member <MEMBER-ID>] local-file {<REMOTE-URL> [vrf <VRF-NAME>] | <STORAGE-
URL>}
```

The **module** and **standby** are supported only on 6400 switch. The **vsf member** is supported only on 6300 switch.

### Description

Stores a set of support files as a compressed file in the switch locally and copies the preserved support files to a directory using TFTP, SFTP, SCP, or USB.

You can store only one copy of the support file locally. When you store a new support file, it overwrites the existing support file.

| Parameter | Description |
|---|---|
| *<FEATURE-NAME>* | Specifies the feature for the support files. |

| Parameter | Description |
|---|---|
| *<SLOT-ID>* | Specifies the module slot number identifier for the support files. Range: 1/1-1/4, 1/7-1/10 |
| *<MEMBER-ID>* | Specifies the VSF member identifier for the support files. Range: 1-10 |
| *<REMOTE-URL>* | Specifies the URL to copy the support files. |
| *<STORAGE-URL>* | Specifies the USB to copy the support files. |
| *<VRF-NAME>* | Specifies the VRF name. The default VRF name is default. |

## Usage

If the copy of the support files to the destination fails, an alternate option is prompted to store the collected data in the local file. This helps us to retry the copy process using **copy support-files local-file *<REMOTE-URL/STORAGE-URL>*** without the need of regenerating the file.

## Examples

Copying support file to the local file:

```
switch# copy support-files local-file
switch# copy support-files feature lldp local-file
switch# copy support-files previous-boot local-file
switch# copy support-files all local-file
The operation to copy all support files could take a while to complete.
Do you want to continue (y/n)?
switch# copy support-files module 1/1 local-file
switch# copy support-files standby local-file
switch# copy support-files vsf member 7 local-file
```

Copying local support file to a remote URL and storage URL:

```
switch# copy support-files local-file usb:/support_files_dir_path/
switch# copy support-files local-file scp://root@10.0.14.206//support_files_dir_
path/abc.tar.gz vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# copy support-files vsf member

Applicable for 6300 switches only.

```
copy support-files vsf member <MEMBER-ID> {<REMOTE-URL> [vrf <VRF-NAME>] | <STORAGE-URL>}
```

## Description

Copies a set of support files using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | Specified the member-id of the VSF member. Required. |
| {*<REMOTE-URL>* [vrf *<VRF-NAME>* \| *<STORAGE-URL>*]} | Select either the remote URL or the storage URL for the destination of the copied command output. Required. |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*] [;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \| *<HOST>*}[:*<PORT>*]/*<FILE>*** |
| vrf *<VRF-NAME>* | Specifies the VRF name. The default VRF name is default. Optional. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax: **{usb}:/*<FILE>*** |

## Usage

If feature name is not provided, the command collects generic system-specific support information. If a feature name is provided, the command collects feature-specific support information.

## Examples

Copying the support files to a USB:

```
switch# copy support-files vsf member 2 usb:/file.tar.gz
```

Copying all the support files to a remote URL with a specified VRF:

```
switch# copy support-files vsf member 2 scp://user@10.100.0.12/file.tar.gz/ vrf
mgmt
```

Copying all the support files to a remote URL with a specified VRF:

```
switch# copy support-files vsf member 2 sftp://user@10.100.0.12/support_files_dir_
path/ vrf mgmt
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## copy support-log

`copy support-log` *`<DAEMON-NAME>`* `[`*`<MEMBER/SLOT>`*`] {`*`<STORAGE-URL>`*` | `*`<REMOTE-URL>`*` [vrf `*`<VRF-NAME>`*`]}`

### Description

Copies the specified support log for a daemon TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<MEMBER/SLOT>* | Specifies the slot ID on an 8400 or 6400 switch. Optional.<br>Syntax: Slot number for line (**1/1-1/4**, **1/7-1/10**) MM(**1/5** or **1/6**) |
| *<DAEMON-NAME>* | Specifies the name of the daemon. Required. |
| {*<STORAGE-URL>* \| *<REMOTE-URL>* [vrf *<VRF-NAME>*]} | Selects either the storage URL or the remote URL for the destination of the copied command output. Required. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax: **{usb}:/*<FILE>*** |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>■ **{tftp://}{*<IP>* \| *<HOST>*}[:*<PORT>*] [;blocksize=*<VAL>*]/*<FILE>***<br>■ **{sftp:// \| scp:// *<USER>*@}{*<IP>* \|** |

| Parameter | Description |
|---|---|
| | ***<HOST>}[:<PORT>]/<FILE>*** |
| `vrf <VRF-NAME>` | Specifies the VRF name. If no VRF name is provided, the VRF named *default* is used. Optional. |

### Usage

Fast log is a high performance, per-daemon binary logging infrastructure used to debug daemon level issues by precisely capturing the per daemon/module/functionalities debug traces in real time. Fast log, also referred to as support logs, helps users to understand the feature internals and its specific happenings. The fast logs from one daemon are not overwritten by other daemon logs because fast logs are captured as part of a daemon core dump. Fast logs are enabled by default.

### Examples

Copying the support log from the daemon hpe-fand to a remote URL:

```
switch# copy support-log hpe-fand tftp://10.100.0.12/file
```

Copying the support log from the daemon fand to a remote URL with a VRF named mgmt:

```
switch# copy support-log fand scp://user@10.100.0.12/file vrf mgmt
```

Copying the support log from the daemon hpe-fand to a remote URL with a VRF named mgmt:

```
switch# copy support-log hpe-fand tftp://10.100.0.12/file vrf mgmt
```

Copying the support log from the daemon hpe-fand to a USB:

```
switch# copy support-log hpe-fand usb:/support-log
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## copy support-log vsf member

Applicable for 6300 switches only.

`copy support-log vsf member <MEMBER-ID> <DAEMON-NAME> {<STORAGE-URL> | <REMOTE-URL> [vrf <VRF-NAME>]}`

### Description

Copies the specified support log for a daemon using TFTP, SFTP, SCP, or USB.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | Specifies the member-id of the VSF member. Required. |
| *<DAEMON-NAME>* | Specifies the name of the daemon. Required. |
| {*<STORAGE-URL>* \| *<REMOTE-URL>* [vrf *<VRF-NAME>*]} | Selects either the storage URL or the remote URL for the destination of the copied command output. Required. |
| *<STORAGE-URL>* | Specifies the USB to copy command output.<br>Syntax: **{usb}:/<*FILE*>** |
| *<REMOTE-URL>* | Specifies the URL to copy the command output.<br>Syntax:<br>▪ **{tftp://}{<*IP*> \| <*HOST*>}[:<*PORT*>] [;blocksize=<*VAL*>]/<*FILE*>**<br>▪ **{sftp:// \| scp:// <*USER*>@}{<*IP*> \| <*HOST*>}[:<*PORT*>]/<*FILE*>** |
| vrf *<VRF-NAME>* | Specifies the VRF name. If no VRF name is provided, the VRF named *default* is used. Optional. |

### Usage

Fast log is a high performance, per-daemon binary logging infrastructure used to debug daemon level issues by precisely capturing the per daemon/module/functionalities debug traces in real time. Fast log, also referred to as support logs, helps users to understand the feature internals and its specific happenings. The fast logs from one daemon are not overwritten by other daemon logs because fast logs are captured as part of a daemon core dump. Fast logs are enabled by default.

### Examples

Copying the support log from the daemon hpe-fand to a remote URL with a VRF named mgmt:

```
switch# copy support-log vsf member 2 hpe-fand tftp://10.100.0.12/file vrf mgmt
```

Copying the support log from the daemon hpe-fand to a remote URL with a VRF named mgmt:

```
switch# copy support-log vsf member 2 hpe-fand scp://user@10.100.0.12/file vrf
mgmt
```

Copying the support log from the daemon hpe-fand to a USB:

```
switch# copy support-log vsf member 2 hpe-fand usb:/support-log
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added SCP support. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# Chapter 151

# Switch system and hardware commands

## bluetooth disable

```
bluetooth disable
no bluetooth disable
```

### Description

Disables the Bluetooth feature on the switch. The Bluetooth feature includes both Bluetooth Classic and Bluetooth Low Energy (BLE). Bluetooth is enabled by default.

The **no** form of this command enables the Bluetooth feature on the switch.

### Example

Disabling Bluetooth on the switch. *<XXXX>* is the switch platform and *<NNNNNNNNNN>* is the device identifier.

```
switch(config)# bluetooth disable
switch# show bluetooth
Enabled              : No
Device name          : <XXXX>-<NNNNNNNNNN>

switch(config)# show running-config
...
bluetooth disabled
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## bluetooth enable

```
bluetooth enable
no bluetooth enable
```

### Description

This command enables the Bluetooth feature on the switch. The Bluetooth feature includes both Bluetooth Classic and Bluetooth Low Energy (BLE).

Default: Bluetooth is enabled by default.

The **no** form of this command disables the Bluetooth feature on the switch.

### Usage

The default configuration of the Bluetooth feature is `enabled`. The output of the `show running-config` command includes Bluetooth information only if the Bluetooth feature is disabled.

The Bluetooth feature includes both Bluetooth Classic and Bluetooth Low Energy (BLE).

The Bluetooth feature requires the USB feature to be enabled. If the USB feature has been disabled, you must enable the USB feature before you can enable the Bluetooth feature.

### Examples

```
switch(config)# bluetooth enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## clear events

```
clear events
```

### Description

Clears up event logs. Using the `show events` command will only display the logs generated after the `clear events` command.

### Examples

Clearing all generated event logs:

```
switch# show events
---------------------------------------------------
show event logs
---------------------------------------------------
2018-10-14:06:57:53.534384|hpe-sysmond|6301|LOG_INFO|MSTR|1|System resource
utilization poll interval is changed to 27
2018-10-14:06:58:30.805504|lldpd|103|LOG_INFO|MSTR|1|Configured LLDP tx-timer to
36
2018-10-14:07:01:01.577564|hpe-sysmond|6301|LOG_INFO|MSTR|1|System resource
utilization poll interval is changed to 49

switch# clear events

switch# show events
---------------------------------------------------
show event logs
---------------------------------------------------
2018-10-14:07:03:05.637544|hpe-sysmond|6301|LOG_INFO|MSTR|1|System resource
utilization poll interval is changed to 34
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## clear ip errors

`clear ip errors`

### Description

Clears all IP error statistics.

### Example

Clearing and showing ip errors:

```
switch# clear ip errors
switch# show ip errors
----------------------------------
Drop reason                Packets
----------------------------------
```

```
Malformed packets                0
IP address errors                0
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# console baud-rate

```
console baud-rate <SPEED>
no console baud-rate <SPEED>
```

## Description

Sets the console serial port speed.

The no form of this command resets the console port speed to its default of 115200 bps.

| Parameter | Description |
|---|---|
| *<SPEED>* | Selects the console port speed in bps, either `9600` or `115200`. |

## Usage

The speed change occurs immediately for the active console session. The console will be inaccessible until the client terminal settings are updated to match the console port speed that you set. After the command is executed you will be prompted to log in again.

## Examples

Setting the console port speed to 9600 bps:

```
switch(config)# console baud-rate 9600
This command will configure the baud rate immediately for the active serial
console session. After the command is executed the user will be prompted to
re-login. The serial console will be inaccessible until the terminal client
settings are updated to match the baud rate of the switch.
Continue (y/n)? y
```

Resetting the console port to its default speed 115200 bps:

```
switch(config)# no console baud-rate
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |

## domain-name

```
domain-name <NAME>
no domain-name [<NAME>]
```

### Description

Specifies the domain name of the switch.

The **no** form of this command sets the domain name to the default, which is no domain name.

| Parameter | Description |
|---|---|
| *<NAME>* | Specifies the domain name to be assigned to the switch. The first character of the name must be a letter or a number. Length: 1 to 32 characters. |

### Examples

Setting and showing the domain name:

```
switch# show domain-name

switch# config
switch(config)# domain-name example.com
switch(config)# show domain-name
example.com
switch(config)#
```

Setting the domain name to the default value:

```
switch(config)# no domain-name
switch(config)# show domain-name

switch(config)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## hostname

```
hostname <HOSTNAME>
no hostname [<HOSTNAME>]
```

### Description

Sets the host name of the switch.

The **no** form of this command sets the host name to the default value, which is `switch`.

| Parameter | Description |
|---|---|
| *<HOSTNAME>* | Specifies the host name. The first character of the host name must be a letter or a number. Length: 1 to 32 characters. Default: `switch` |

### Examples

Setting and showing the host name:

```
switch# show hostname
switch
switch# config
switch(config)# hostname myswitch
myswitch(config)# show hostname
myswitch
```

Setting the host name to the default value:

```
myswitch(config)# no hostname
switch(config)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## module admin-state

```
module <SLOT-ID> admin-state {diagnostic | down | up}
no module <SLOT-ID> [admin-state [diagnostic | down | up]]
```

### Description

Sets the administrative state of the specified line module.

The **no** form of the command configures administrative state to the default **up**.

| Parameter | Description |
|---|---|
| *<SLOT-ID>* | Specifies the member and slot of the module. For example, to specify the module in member 1, slot 3, enter the following:<br>`1/3` |
| `diagnostic` | Selects the **diagnostic** administrative state. Network traffic does not pass through the module. |
| `down` | Selects the **down** administrative state. Network traffic does not pass through the module. |
| `up` | Selects the **up** administrative state. The line module is fully operational. The **up** state is the default administrative state. |

### Example

Setting the administrative state of the module in slot **1/3** to **down**:

```
switch(config)# module 1/3 admin-state down
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

## module product-number

```
module <SLOT-ID> product-number [<PRODUCT-NUM>]
no module <SLOT-ID> [product-number [<PRODUCT-NUM>]]
```

### Description

Changes the configuration of the switch to indicate that the specified member and slot number contains, or will contain, a line module.

The **no** form of this command removes the line module and its interfaces from the configuration. If there is a line module installed in the slot, the line module is powered off and then powered on.

| Parameter | Description |
|---|---|
| *<SLOT-ID>* | Specifies the member and slot in the form **m/s**, where **m** is the member number, and **s** is the slot number. |
| *<PRODUCT-NUM>* | Specifies the product number of the line module. For example: `JL363A`<br>If there is a line module installed in the slot when you execute this command, *<PRODUCT-NUM>* is optional. The switch reads the product number information from the module that is installed in the slot.<br>If there is no line module installed in the slot when you execute this command, *<PRODUCT-NUM>* is required. |

### Usage

The default configuration associated with a line module slot is:

- There is no module product number or interface configuration information associated with the slot. The slot is available for the installation with any supported line module.
- The Admin State is Up (which is the default value for Admin State).

To add a line module to the configuration, you must use the **module** command either before or after you install the physical module.

If you execute the **module** command after you install a line module in an empty slot, you can omit the **<PRODUCT-NUM>** variable. The switch reads the product information from the installed module.

If the module is not installed in the slot when you execute the module command, you must specify a value for the **<PRODUCT-NUM>** variable:

- The switch validates the product number of the module against the slot number you specify to ensure that the right type of module is configured for the specified slot.

For example, the switch returns an error if you specify the product number of a line module for a slot reserved for management modules.

- You can configure the line module interfaces before the line module is installed.

When you install the physical line module in a preconfigured slot, the following actions occur:

- If a product number was specified in the command and it matches the product number of the installed module, the switch initializes the module.
- If a product number was specified in the command and the product number of the module does not match what was specified, the module device initialization fails.

The **no** form of the command removes the line module and its interfaces from the configuration and restores the line module slot to the default configuration.

If there is a line module installed in the slot when you execute the **no** form of the command, the command also powers off and then powers on the module. Traffic passing through the line module is stopped. Management sessions connected through the line module are also affected.

If the slot associated with the line module is in the default configuration, you can remove the module from the chassis without disrupting the operation of the switch.

## Examples

Configuring slot 1/1 for future installation of a line module:

```
switch(config)# module 1/1 product-number jl363a
```

Configuring a line module that is already installed in slot 1/1:

```
switch(config)# module 1/1 product-number
```

Attempting to configure slot 1/1 for the future installation of a line module without specifying the product number (returned error shown):

```
switch(config)# module 1/1 product-number
Line module '1/4' is not physically available.  Please provide the product
number to preconfigure the line module.
```

Removing a module from the configuration:

```
switch(config)# no module 1/1
This command will power cycle the specified line module and restore its default
```

```
configuration. Any traffic passing through the line module will be interrupted.
Management sessions connected through the line module will be affected. It
might take a few minutes to complete this operation.

Do you want to continue (y/n)? y
switch(config)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

## mtrace

```
mtrace <IPV4-SRC-ADDR> <IPV4-GROUP-ADDR> [lhr <IPV4-LHR-ADDR>] [ttl <HOPS>]
   [vrf <VRF-NAME>]
```

### Description

Traces the specified IPv4 source and group addresses.

| Parameter | Description |
|---|---|
| *IPV4-SRC-ADDR* | Specifies the source IPv4 address to trace. |
| *IPV4-GROUP-ADDR* | Specifies the group IPv4 address to trace. |
| `lhr` *<IPV4-LHR-ADDR>* | Specifies the last hop router address from which to start the trace. |
| `ttl` *<HOPS>* | Specifies the Time-To-Live duration in hops. Range: 1 to 255 hops. Default: 8 hops. |
| `vrf` *<VRF-NAME>* | Specifies the name of the VRF. If a name is not specified the default VRF will be used. |

### Examples

Tracing with source, group, and LHR addresses and TTL:

```
(switch)# mtrace 20.0.0.1 239.1.1.1 lhr 10.1.1.1 ttl 10

Type escape sequence to abort.
Mtrace from 10.0.0.1 for Source 20.0.0.1 via Group 239.1.1.1
From destination(?) to source (?)...
Querying ful reverse path...
0  10.0.0.1
-1  30.0.0.1 PIM  0 ms
-2  40.0.0.1 PIM  2 ms
-3  50.0.0.1 PIM  100 ms
-4  60.0.0.1 PIM  156 ms
-5  20.0.0.1 PIM  123 ms
```

Tracing with source and group addresses:

```
(switch)# mtrace 200.0.0.1 239.1.1.1

Type escape sequence to abort.
Mtrace from self for Source 200.0.0.1 via Group 239.1.1.1
From destination(?) to source (?)...
Querying ful reverse path...
0  10.0.0.1
-1  30.0.0.1 PIM  0 ms
-2  40.0.0.1 PIM  2 ms
-3  50.0.0.1 PIM  100 ms
-4  60.0.0.1 PIM  156 ms
-5  200.0.0.1 PIM  123 ms
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## power consumption-average-period

`power consumption-average-period <PERIOD-IN-SECONDS>`

### Description

Configures a time period for average power consumption in seconds.

| Parameter | Description |
|---|---|
| *<PERIOD-IN-SECONDS>* | Specifies the period in seconds for average power consumed.<br>Range: 60-3600. Default: 600 |

### Example

Configuring a time period of 60 seconds for average power consumption:

```
switch(config)# power consumption-average-period 60
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## show bluetooth

```
show bluetooth
```

### Description

Shows general status information about the Bluetooth wireless management feature on the switch.

### Usage

This command shows status information about the following:

- The USB Bluetooth adapter
- Clients connected using Bluetooth
- The switch Bluetooth feature.

The output of the **show running-config** command includes Bluetooth information only if the Bluetooth feature is disabled.

The device name given to the switch includes the switch serial number to uniquely identify the switch while pairing with a mobile device.

The management IP address is a private network address created for managing the switch through a Bluetooth connection.

### Examples

Example output when Bluetooth is enabled but no Bluetooth adapter is connected. *<XXXX>* is the switch platform and *<NNNNNNNNNN>* is the device identifier.

```
switch# show bluetooth
Enabled             : Yes
Device name         : <XXXX>-<NNNNNNNNNN>
Adapter State       : Absent
```

Example output when Bluetooth is enabled and there is a Bluetooth adapter connected:

```
switch# show bluetooth
Enabled             : Yes
Device name         : <XXXX>-

Adapter State       : Ready
Adapter IP address  : 192.168.99.1
Adapter MAC address : 480fcf-af153a

Connected Clients
-----------------
Name            MAC Address     IP Address    Connected Since
--------------  --------------  ------------  ------------------------
Mark's iPhone   089734-b12000   192.168.99.10  2018-07-09 08:47:22 PDT
```

Example output when Bluetooth is disabled:

```
switch# show bluetooth
Enabled             : No
Device name         : <XXXX>-<NNNNNNNNNN>
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show boot-history

```
show boot-history [all|{vsf member <1-10>}]
```

## Description

Shows boot history information. When no parameters are specified, shows the most recent information about the current boot operation, and the three previous boot operations for the switch. When the **all** parameter is specified, the output of this command shows the boot information for the active management module.

For switches that support line modules (such as 6400 switch series) including the **all** parameter displays information for the active management module and all available line modules.

To view boot-history on a standby, the command must be sent on the conductor console.

| Parameter | Description |
|---|---|
| `all` | Optional. Shows boot information for the active management module. For switches that support line modules, including this parameter displays information for and all available line modules. |
| `vsf member <1-10>` | Optional. Display boot history for the specified VSF member |

## Usage

This command displays the boot-index, boot-ID, and up time in seconds for the current boot. If there is a previous boot, it displays boot-index, boot-ID, reboot time (based on the time zone configured in the system) and reboot reasons. Previous boot information is displayed in reverse chronological order.

The output of this command includes the following information:

| Parameter | Description |
|---|---|
| `Index` | The position of the boot in the history file. Range: 0 to 3. |
| `Boot ID` | A unique ID for the boot . A system-generated 128-bit string. |
| `Current Boot, up for <time>` | For the current boot, the **show boot-history** command shows the number of seconds the module has been running on the current software. |
| `<Timestamp>: boot reason` | For previous boot operations, the **show boot-history** command shows the time at which the operation occurred and the reason for the boot. The reason for the boot is one of the following values:<br>■ ***<DAEMON-NAME>* crash**: The daemon identified by *<DAEMON-NAME>* caused the module to boot.<br>■ **Kernel crash**: The operating system software associated with the module caused the module to boot.<br>■ **Uncontrolled reboot**: The reason for the reboot is not known.<br>■ **Reboot requested through database**: The reboot occurred because of a request made through the CLI or other API. For details, see , show boot-history |

**Table 1:** *Description of reboots handled through the database*

| Boot History String | Description |
|---|---|
| Reboot requested by user | A user requested a switch reboot through the CLI or web UI. |
| Reset button pressed | The switch detected a short-press of the reset button |
| Backplane fault | A backplane fault occurred. |
| Configuration change | A configuration change resulted in a reboot. |
| Configuration version migration | A configuration version migration occurred which required a reboot. |
| Console error | The console failed to start. |
| Fabric fault | A fabric fault occurred. |
| All line modules faulted | A zero line card condition occurred. |
| Redundancy switchover requested | A user requested a redundancy switchover. |
| Redundant Management communication timeout | The standby management module has taken over from an unresponsive active management module. |
| Redundant Management election timeout | A failure to elect a standby management module in the allotted time. |
| Critical service fault (error) | A daemon critical to switch operation has stopped functioning. An extra error string may be present to describe the error in detail. |
| VSF autojoin renumber | Reset triggered by VSF autojoin. |
| VSF member renumbered | A user requested a renumber of a VSF member. |
| VSF switchover requested | A user requested a VSF switchover. |
| VSX software update | Reset triggered by a VSX software update. |
| Chassis critical temperature | Chassis operating temperature exceeded. |
| Chassis low critical temperature | Chassis temperature below the minimum operating threshold. |
| Chassis insufficient fans | Insufficient fans to cool the chassis. |
| Chassis unsupported PSUs/fans | Unsupported or misconfigured PSUs or system fans. |
| Management module critical temperature | Management module operating temperature exceeded. |
| ISSU SMM update | Standby management module reboot triggered by an In-Service Software Upgrade (ISSU). |
| ISSU switchover | Redundancy switchover triggered by an In-Service Software Upgrade. |

| Boot History String | Description |
|---|---|
| ISSU aborted | Standby management module reset triggered by failure during an In-Service Software Upgrade. |
| Rollback timer expired | Reset triggered by the ISSU rollback timer expiring. |

## Examples

Showing the boot history of the active management module:

```
switch# show boot-history
Management module
=================

Index : 2
Boot ID : c34a2c2499004a02bbeeff4992e1fdbd
Current Boot, up for 1 days 13 hrs 13 mins 27 secs

Index : 1
Boot ID : bfba9bc486304e57904ac717a0ccbdcd
02 Sep 23 02:55:33 : CPU request reset with 0x20201, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:55:33 : Switch boot count is 2

Index : 0
Boot ID : a88a71b7ca9a4574af7e3b811ddfdc7e
02 Sep 23 02:49:26 : Reboot requested by user, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:50:02 : Switch boot count is 1

Index : 3
Boot ID : f00ba10c8c44457f83fee303d014a89a
25 Aug 23 10:27:42 :  Power on reset with 0x1, Version: FL.10.14.0000-1465-
g9df95249d06b0~dirty
25 Aug 23 10:28:18 :  Switch boot count is 3
25 Aug 23 10:29:02 :  Primary overtemperature fault detected with 0x2 in PSU 1/1
```

(For 6400 Switch series) Showing the boot history of the active management module and all line modules:

```
switch#
Management module
=================

Index : 3
Boot ID : f1bf071bdd04492bbf8439c6e479d612
Current Boot, up for 22 hrs 12 mins 22 secs

Index : 2
Boot ID : edfa2d6598d24e989668306c4a56a06d
07 Aug 18 16:28:01 : Reboot requested through database

Index : 1
Boot ID : 0bda8d0361df4a7e8e3acdc1dba5caad
07 Aug 18 14:08:46 : Reboot requested through database

Index : 0
Boot ID : 23da2b0e26d048d7b3f4b6721b69c110
```

```
07 Aug 18 13:00:46 : Reboot requested through database

Line module 1/1
=================
Index : 3
10 Aug 17 12:45:46 : dune_agent crashed
...

Management module
=================

Index : 3
Boot ID : f1bf071bdd04492bbf8439c6e479d612
Current Boot, up for 22 hrs 12 mins 22 secs

Index : 2
Boot ID : edfa2d6598d24e989668306c4a56a06d
07 Aug 18 16:28:01 : Reboot requested through database

Index : 1
Boot ID : 0bda8d0361df4a7e8e3acdc1dba5caad
07 Aug 18 14:08:46 : Reboot requested through database

Index : 0
Boot ID : 23da2b0e26d048d7b3f4b6721b69c110
07 Aug 18 13:00:46 : Reboot requested through database

Line module 1/1
=================
Index : 3
10 Aug 17 12:45:46 : dune_agent crashed
...
```

In the event of a reset triggered by a power supply unit (PSU), or a PSU input fault, the output of this command also displays information about why the PSU initiated a reboot. The following example displays the boot history of a switch with a reboot initiated by a PSU.

```
switch# show boot-history

Management module
=================
Index : 2
Boot ID : a61ad00d10864c748bc7893a5d4af2e4
15 Dec 23 19:02:02 : Power on reset with 0x1, Version: FL.10.13.1000AF

15 Dec 23 19:02:02 : Switch boot count is 0
15 Dec 23 19:02:17 : PSU 1/1: Fault detected

Index : 1
Boot ID : 30d831bbfdfa425baf50a629ee01b185
15 Dec 23 19:01:58 : Power on reset with 0x1, Version: FL.10.13.1000AF
15 Dec 23 19:01:58 : Switch boot count is 0
```

The following example displays the boot history for the VSF member **2**.

```
switch# show boot-history vsf member 2

Member-2
=========
Index : 0
Boot ID : df99026c194a44f1944a3e7685fb4d90
Current Boot, up for 3 hrs 31 mins 39 secs

Index : 3
Boot ID : 7bf4104903fe4ad1ba4bce40e8099c76
10 Aug 17 10:02:24 : Reboot requested through database
10 Aug 17 10:02:13 : Switch boot count is 2
```

For more information on features that use this command, refer to the Fundamentals Guide or the Monitoring Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13.1000 | The output of this command is enhanced to display additional information about the reason for the reboot, if available. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show capacities

```
show capacities <FEATURE> [vsx-peer]
```

### Description

Shows system capacities and their values for all features or a specific feature.

| Parameter | Description |
|---|---|
| *<FEATURE>* | Specifies a feature. For example, **aaa** or **vrrp**. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

Capacities are expressed in user-understandable terms. Thus they may not map to a specific hardware or software resource or component. They are not intended to define a feature exhaustively.

### Examples

Showing all available capacities for BGP:

```
switch# show capacities bgp

System Capacities: Filter BGP
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of AS numbers in as-path attribute
32
...
```

Showing all available capacities for mirroring:

```
switch# show capacities mirroring

System Capacities: Filter Mirroring
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of Mirror Sessions configurable in a system
4
Maximum number of enabled Mirror Sessions in a system
4
```

Showing all available capacities for MSTP:

```
switch# show capacities mstp

System Capacities: Filter MSTP
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of mstp instances configurable in a system
64
```

Showing all available capacities for VLAN count:

```
switch# show capacities vlan-count

System Capacities: Filter VLAN Count
Capacities Name                                                             Value
----------------------------------------------------------------------------------
-
Maximum number of VLANs supported in the system
4094
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show capacities-status

`show capacities-status <FEATURE> [vsx-peer]`

### Description

Shows system capacities status and their values for all features or a specific feature.

| Parameter | Description |
|---|---|
| *<FEATURE>* | Specifies the feature, for example **aaa** or **vrrp** for which to display capacities, values, and status. Required. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing the system capacities status for all features:

```
switch# show capacities-status

System Capacities Status
Capacities Status Name                                           Value Maximum
------------------------------------------------------------------------------
Number of active gateway mac addresses in a system               0      16
Number of aspath-lists configured                                0      64
Number of community-lists configured                             0      64
...
```

Showing the system capacities status for BGP:

```
switch# show capacities-status bgp

System Capacities Status: Filter BGP
Capacities Status Name                                            Value Maximum
-------------------------------------------------------------------------------
Number of aspath-lists configured                                 0      64
Number of community-lists configured                              0      64
Number of neighbors configured across all VRFs                    0      50
Number of peer groups configured across all VRFs                  0      25
Number of prefix-lists configured                                 0      64
Number of route-maps configured                                   0      64
Number of routes in BGP RIB                                       0   256000
Number of route reflector clients configured across all VRFs      0      16
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show console

```
show console
```

### Description

Shows the serial console port current speed.

### Examples

Showing the console port current speed:

```
switch# show console
Baud Rate: 9600
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show core-dump

```
show core-dump [all | <SLOT-ID>]
```

## Description

Shows core dump information about the specified module. When no parameters are specified, shows only the core dumps generated in the current boot of the management module. When the **all** parameter is specified, shows all available core dumps.

| Parameter | Description |
|---|---|
| `all` | Shows all available core dumps. |
| *`<SLOT-ID>`* | Shows the core dumps for the management module or line module in **`<SLOT-ID>`**. **`<SLOT-ID>`** specifies a physical location on the switch. Use the format **member/slot/port** (for example, `1/3/1`) for line modules. Use the format **member/slot** for management modules.<br>You must specify the slot ID for either the active management module, or the line module. |

## Usage

When no parameters are specified, the `show core-dump` command shows only the core dumps generated in the current boot of the management module. You can use this command to determine when any crashes are occurring in the current boot.

If no core dumps have occurred, the following message is displayed: **No core dumps are present**

To show core dump information for the standby management module, you must use the **standby** command to switch to the standby management module and then execute the **show core-dump** command.

In the output, the meaning of the information is the following:

`Daemon Name`
Identifies name of the daemon for which there is dump information.

`Instance ID`
Identifies the specific instance of the daemon shown in the **Daemon Name** column.

`Present`
Indicates the status of the core dump:

`Yes`
The core dump has completed and available for copying.

`In Progress`
Core dump generation is in progress. Do not attempt to copy this core dump.

`Timestamp`
Indicates the time the daemon crash occurred. The time is the local time using the time zone configured on the switch.

`Build ID`
Identifies additional information about the software image associated with the daemon.

## Examples

Showing core dump information for the current boot of the active management module only:

```
switch# show core-dump
==================================================================================
Daemon Name      | Instance ID | Present     | Timestamp                | Build ID
==================================================================================
hpe-fand          1399          Yes         2017-08-04 19:05:34       1246d2a
hpe-sysmond       957           Yes         2017-08-04 19:05:29       1246d2a
==================================================================================
Total number of core dumps : 2
==================================================================================


==================================================================================
Daemon Name      | Instance ID | Present     | Timestamp                | Build ID
==================================================================================
hpe-fand          1399          Yes         2017-08-04 19:05:34       1246d2a
hpe-sysmond       957           Yes         2017-08-04 19:05:29       1246d2a
==================================================================================
Total number of core dumps : 2
==================================================================================
```

Showing all core dumps:

```
switch# show core-dump all
=============================================================================
Management Module core-dumps
=============================================================================
Daemon Name      | Instance ID | Present     | Timestamp              | Build ID
=============================================================================
hpe-sysmond       513           Yes         2017-07-31 13:58:05     e70f101
hpe-tempd         1048          Yes         2017-08-13 13:31:53     e70f101
hpe-tempd         1052          Yes         2017-08-13 13:41:44     e70f101

Line Module core-dumps
=============================================================================
Line Module : 1/1
=============================================================================
dune_agent_0      18958         Yes         2017-08-12 11:50:17     e70f101
dune_agent_0      18842         Yes         2017-08-12 11:50:09     e70f101
=============================================================================
Total number of core dumps : 5
=============================================================================
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show deprecated commands

```
show deprecated-commands [<feature>]
```

## Description

Shows the list of CLI commands that will be deprecated in a future release along with the new form of the same command which is recommended for use.

Both the command options will be supported until a certain release, after which only the newer replacement command will be supported.

| Parameter | Description |
|---|---|
| `feature` | Optional.<br>Specify feature name.<br>The list of features for which you can view deprecated commands are:<br>■ bgp<br>■ dsnoop<br>■ ipfix<br>■ lldp<br>■ ndmd<br>■ ptp<br>■ qos<br>■ routing<br>■ snmp<br>■ tunnel<br>■ vlan<br>■ vrf<br>■ vrrp |

## Examples

Check the deprecated CLI commands for a specific feature:

```
switch# show deprecated-commands
----------------------------------------------------------------------------------
-----------
The following commands with ipv4 keyword will be replaced with ip
----------------------------------------------------------------------------------
-----------

Deprecated:  vrrp <1-255> address-family (ipv4 | ipv6)
Replacement: vrrp <1-255> address-family (ip | ipv6)

Deprecated:  show bgp ipv4 unicast
Replacement: show bgp ip unicast
...

switch# show deprecated-commands vrrp
----------------------------------------------------------------------------------
-----------
The following commands with ipv4 keyword will be replaced with ip
----------------------------------------------------------------------------------
-----------

Deprecated:  vrrp <1-255> address-family (ipv4 | ipv6)
```

```
Replacement: vrrp <1-255> address-family (ip | ipv6)

Deprecated:  show vrrp (ipv4 | ipv6 | brief | detail)(<1-255>)
Replacement: show vrrp (ip | ipv6 | brief | detail)(<1-255>)
...

switch# show deprecated-commands vsf
Feature vsf has no deprecated commands.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show domain-name

`show domain-name [vsx-peer]`

### Description

Shows the current domain name.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

If there is no domain name configured, the CLI displays a blank line.

### Example

Setting and showing the domain name:

```
switch# show domain-name

switch# config
```

```
switch(config)# domain-name example.com
switch(config)# show domain-name
example.com
switch(config)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show environment fan

```
show environment fan [vsf | vsx-peer]
```

### Description

Shows the status information for all fans and fan trays (if present) in the system.

| Parameter | Description |
|---|---|
| vsf | Shows output from the VSF member-id on switches that support VSF. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

For fan trays, **Status** is one of the following values:

- ready:The fan tray is operating normally.
- fault:The fan tray is in a fault event. The status of the fan tray does not indicate the status of fans.
- empty:The fan tray is not installed in the system.

For fans:

```
Speed :Indicates the relative speed of the fan based on the nominal speed range of the
fan. Values are:
   Slow:The fan is running at less than 25% of its maximum speed.
   Normal:The fan is running at 25-49% of its maximum speed.
```

Medium:The fan is running at 50-74% of its maximum speed.
Fast:The fan is running at 75-99% of its maximum speed.
Max:The fan is running at 100% of its maximum speed.
N/A:The fan is not installed.

Direction: The direction of airflow through the fan. Values are:
front-to-back:Air flows from the front of the system to the back of the system.
N/A:The fan is not installed.

Status: Fan status. Values are:
**uninitialized:**The fan has not completed initialization.
**ok**: The fan is operating normally.
**fault**: The fan is in a fault state.
**empty**: The fan is not installed.

## Examples

Showing output for systems with fan trays for 6300 switch series:

```
switch# show environment fanFan tray information
-------------------------------------------
-----------------------------------
Name Description Status Serial Number
Fans
-------------------------------------------
-----------------------------------
1/1 JL669A Aruba X751 FB Fan Tray ready
CN97KN9131 2
1/2 JL669A Aru
---------------------------------------------------------------------------
1/1/1         N/A      N/A            slow    front-to-back  ok      5371
1/1/2         N/A      N/A            slow    front-to-back  ok      5320
1/1/3         N/A      N/A            slow    front-to-back  ok      5328
1/1/4         N/A      N/A            slow    front-to-back  ok      5256
1/2/1         N/A      N/A            slow    front-to-back  ok      5371
1/2/2         N/A      N/A            slow    front-to-back  ok      5349
1/2/3         N/A      N/A            slow    front-to-back  ok      5292
1/2/4         N/A      N/A            slow    front-to-back  ok      5349
1/3/1         N/A      N/A            slow    front-to-back  ok      5313
1/3/2         N/A      N/A            slow    front-to-back  ok      5371
1/3/3         N/A      N/A            slow    front-to-back  ok      5379
1/3/4         N/A      N/A            slow    front-to-back  ok      5379
1/4/1         N/A      N/A            slow    front-to-back  ok      5313
1/4/2         N/A      N/A            slow    front-to-back  ok      5299
1/4/3         N/A      N/A            slow    front-to-back  ok      5285
1/4/4         N/A      N/A            slow    front-to-back  ok      5371
```

Showing output for a system without a fan tray:

```
switch# show environment fan

Fan information
---------------------------------------------------------------
Fan   Serial Number  Speed   Direction      Status        RPM
---------------------------------------------------------------
1     SGXXXXXXXXXX   slow    front-to-back  ok            6000
2     SGXXXXXXXXXX   normal  front-to-back  ok            8000
3     SGXXXXXXXXXX   medium  front-to-back  ok            11000
4     SGXXXXXXXXXX   fast    front-to-back  ok            14000
5     SGXXXXXXXXXX   max     front-to-back  fault         16500
6     N/A            N/A     N/A            empty
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show environment led

```
show environment led <MEMBER-ID> [vsx-peer]
```

### Description

Shows state and status information for all the configurable LEDs in the system.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | Shows output from the specified VSF member ID on switches that support VSF. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Showing state and status for LED:

```
switch# show environment led
Mbr/Name       State     Status
-------------------------------
1/locator      off       ok
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show environment power-consumption

```
show environment power-consumption <DETAIL>
show environment power-consumption member <MEMBER-ID>
```

### Description

Displays power consumption information.

| Parameter | Description |
|---|---|
| *<DETAIL>* | Displays detailed power consumption information. |
| *<MEMBER-ID>* | For VSF supported platforms only. Displays the power consumption information for the specified VSF member. Range: 1-10. |

### Usage

Power consumed values are updated every minute. The total power consumed is the total power used in a chasis. The power consumed average is calculated from the total power consumed as a running average over a period of time. The average period has a default of 10 minutes. The period can be configured using **power-consumption-average-period.**

For VSF supported platforms, this command displays the power consumed for all modules of the member in a given argument.

The following information is provided for a summary of power consumption:

- line module: power used by line module
- management module: power used by management module
- fabric module: power used by fabric module
- chassis module: power used by chassis module
- fan module: power used by fan module
- power total: total power consumption
- average power: average for total power consumption that is calculated over a given period
- average period: time to calculate power average

### Example

Showing the power consumption for a switch with a single line card:

```
switch# show environment power-consumption

Power Consumption Averaging Period: 60 seconds

Name     Description          Instantaneous Power (W)      Average Power (W)
----------------------------------------------------------------------------
1        8360-32YAC Switch                     300.00                 311.50
```

Showing the power consumption for a VSF stack:

```
switch# show environment power-consumption

Power Consumption Averaging Period: 60 seconds

Name        Description              Instantaneous Power (W)    Average Power (W)
---------------------------------------------------------------------------------
1           6200M 24G 24G 4SPF+ SW                    300.00               311.50
2           6200M 24G 24G 4SPF+ SW                    280.00               275.50
```

Showing the power consumption for a switch with multiple line cards, in brief:

```
switch# show environment power-consumption

Power Consumption Averaging Period: 60 seconds

Name     Description        Instantaneous Power (W)       Average Power (W)
---------------------------------------------------------------------------
1        6410 v2 Chassis                    1300.00                 1311.50
```

Showing the power consumption for a switch with multiple line cards, in detail:

```
switch# show environment power-consumption detail

Power Consumption Averaging Period: 60 seconds

Name  Module Type      Instantaneous Power (W)       Average Power (W)
-----------------------------------------------------------------------
1     chassis total                    1000.00                 1002.50
1/1     fabric                           40.00
1/1     line                            120.00
1/2     line                            350.00
1/1     management                       20.00
        other                           470.00
```

Showing the power consumption for 4 member stack, in detail:

```
switch# show environment power-consumption detail

Power Consumption Averaging Period: 60 seconds

Name  Module Type      Instantaneous Power (W)       Average Power (W)
-----------------------------------------------------------------------
1     chassis total                     300.00                  302.50
2     chassis total                     320.00                  319.50
3     chassis total                     280.00                  282.50
4     chassis total                     310.00                  311.50
```

```
Total power consumption 1210.00
```

Showing the power consumption for VSF member 2:

```
switch# show environment power-consumption member 2

Power Consumption Averaging Period: 60 seconds

Name  Module Type        Instantaneous Power (W)       Average Power (W)
-------------------------------------------------------------------------
2     6200M 24G 4SFP+ SW                 280.00                  275.00
```

Showing the power consumption for VSF invalid member:

```
switch# show environment power-consumption member 5
Member 5 is not present
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

## show environment power-consumption

*Not supported on the 6300 Switch Series.*

```
show environment power-consumption [vsx-peer]
```

### Description

Shows the power being consumed by each management module, line card, and fabric card subsystem, and shows power consumption for the entire chassis.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Usage

This command is only applicable to systems that support power consumption readings.

The power consumption values are updated once every minute.

The output of this command includes the following information:

| Parameter | Description |
|---|---|
| Name | Shows the member number and slot number of the management module, line module, or fabric card module. |
| Type | Shows the type of module installed at the location specified by Name. |
| Description | Shows the product name and brief description of the module. |
| Usage | Shows the instantaneous power consumption of the module. Power consumption is shown in Watts. |
| Module Total Power Usage | Shows the total power consumption of all the modules listed. Power consumption is shown in Watts. |
| Chassis Total Power Usage | Shows the total instantaneous power consumed by the entire chassis, including modules and components that do not support individual power reporting. Power consumption is shown in Watts. |
| Chassis Total Power Available | Shows the total amount of power, in Watts, that can be supplied to the chassis. |
| Chassis Total Power Allocated | Shows total power, in Watts, that is allocated to powering the chassis and its installed modules. |
| Chassis Total Power Unallocated | Shows the total amount of power, in Watts, that has not been allocated to powering the chassis or its installed modules. This power can be used for additional hardware you install in the chassis. |

## Example

Showing the power consumption for an Aruba 6400 switch:

```
switch> show environment power-consumption
                                                                       Power
Name    Type                Description                                Usage
------------------------------------------------------------------------------
1/1     management-module   R0X31A 6400 Management Module              18 W
1/2     management-module                                              0 W
1/3     line-card-module                                               0 W
1/4     line-card-module    R0X39A 6400 48p 1GbE CL4 PoE 4SFP56 Mod    54 W
1/5     line-card-module                                               0 W
1/6     line-card-module    R0X39A 6400 48p 1GbE CL4 PoE 4SFP56 Mod    56 W
1/7     line-card-module    R0X39A 6400 48p 1GbE CL4 PoE 4SFP56 Mod    51 W
1/1     fabric-card-module  R0X24A 6405 Chassis                        71 W


Module Total Power Usage                                               250 W
```

```
Chassis Total Power Usage                                  294 W

Chassis Total Power Available                              1800 W
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show environment power-supply

```
show environment power-supply [vsf | vsx-peer]
```

### Description

Shows status information about all power supplies in the switch.

| Parameter | Description |
|---|---|
| `vsf` | Shows output from the VSF member-id on switches that support VSF. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

The following information is provided for each power supply:

| Parameter | Description |
|---|---|
| `Mbr/PSU` | Shows the member and slot number of the power supply. |

| Parameter | Description |
|---|---|
| `Product Number` | Shows the product number of the power supply. |
| `Serial Number` | Shows the serial number of the power supply, which uniquely identifies the power supply. |
| `PSU Status` | The status of the power supply. Values are:<br>- **OK**:Power supply is operating normally.<br>- **OK***: Power supply is operating normally, but it is the only power supply in the chassis. One power supply is not sufficient to supply full power to the switch. When this value is shown, the output of the command also shows a message at the end of the displayed data.<br>- **Absent**: No power supply is installed in the specified slot.<br>- **Input fault**: The power supply has a fault condition on its input.<br>- **Output fault**: The power supply has a fault condition on its output.<br>- **Warning**: The power supply is not operating normally.<br>- **Wattage Maximum**: Shows the maximum amount of wattage that the power supply can provide. |

### Example

Showing the output when only one power supply is installed in an Aruba 6400 switch chassis:

```
switch#  show environment power-supply
         Product  Serial                 PSU            Wattage
Mbr/PSU  Number   Number                 Status         Maximum
---------------------------------------------------------------
1/1      R0X36A   CN91KMM2H3             OK             3000
1/2      N/A      N/A                    Absent         0
1/3      N/A      N/A                    Absent         0
1/4      N/A      N/A                    Absent         0
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show environment rear-display-module

`show environment rear-display-module [vsx-peer]`

## Description

Shows information about the display module on the back of the switch.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

Showing the rear display module information on the back of the switch:

```
switch> show environment rear-display-module

Rear display module is ready
Description: 8400 Rear Display Mod
Full Description: 8400 Rear Display Module
Serial number: SG00000000
Part number: 5300_0272
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show environment temperature

`show environment temperature [detail] [vsf | vsx-peer]`

## Description

Shows the temperature information from sensors in the switch that affect fan control.

| Parameter | Description |
|---|---|
| detail | Shows detailed information from each temperature sensor. |
| vsf | Shows output from the VSF member-id on switches that support VSF |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Usage

Temperatures are shown in Celsius.

Valid values for status are the following: \

| Parameter | Description |
|---|---|
| normal | Sensor is within nominal temperature range. |
| max | Highest temperature from this sensor. |
| low_critical | Lowest threshold temperature for this sensor. |
| critical | Highest threshold temperature for this sensor. |
| fault | Fault event for this sensor. |
| emergency | Over temperature event for Over temperature event for this sensor. |

## Examples

Showing current temperature information for a 6300 switch:

```
switch# show environment temperature
Temperature information
------------------------------------------------------------------------------
                                                     Current
Mbr/Slot-Sensor                 Module Type        temperature  Status
------------------------------------------------------------------------------
1/1-PHY-01-04                   line-card-module     45.00 C    normal
1/1-PHY-05-08                   line-card-module     45.00 C    normal
1/1-PHY-09-12                   line-card-module     46.00 C    normal
1/1-PHY-13-16                   line-card-module     47.00 C    normal
1/1-PHY-17-20                   line-card-module     47.00 C    normal
1/1-PHY-21-24                   line-card-module     50.00 C    normal
1/1-PHY-25-28                   line-card-module     45.00 C    normal
1/1-PHY-29-32                   line-card-module     47.00 C    normal
1/1-PHY-33-36                   line-card-module     48.00 C    normal
1/1-PHY-37-40                   line-card-module     47.00 C    normal
1/1-PHY-41-44                   line-card-module     48.00 C    normal
1/1-PHY-45-48                   line-card-module     49.00 C    normal
1/1-Switch-ASIC-Internal        line-card-module     56.25 C    normal

1/1-CPU-Zone-0                  management-module    50.00 C    normal
1/1-CPU-Zone-1                  management-module    50.00 C    normal
```

```
1/1-CPU-Zone-2                  management-module    50.00 C    normal
1/1-CPU-Zone-3                  management-module    51.00 C    normal
1/1-CPU-Zone-4                  management-module    51.00 C    normal
1/1-CPU-diode                   management-module    53.12 C    normal
1/1-DDR                         management-module    45.25 C    normal
1/1-Inlet-Air                   management-module    24.88 C    normal
1/1-MB-IBC                      management-module    45.62 C    normal
1/1-Switch-ASIC-diode           management-module    58.06 C    normal
```

Showing detailed temperature information for a 6300 switch:

```
switch# show environment temperature detail
Detailed temperature information
----------------------------------------------------------------
Mbr/Slot-Sensor      : 1/1-PHY-01-04
Module Type          : line-card-module
Module Description   : JL659A 6300M 48SR5 CL6 PoE 4SFP56 Swch
Status               : normal
Fan-state            : normal
Current temperature  : 45.00 C
Minimum temperature  : 41.00 C
Maximum temperature  : 50.00 C

Mbr/Slot-Sensor      : 1/1-PHY-05-08
Module Type          : line-card-module
Module Description   : JL659A 6300M 48SR5 CL6 PoE 4SFP56 Swch
Status               : normal
Fan-state            : normal
Current temperature  : 45.00 C
Minimum temperature  : 41.00 C
Maximum temperature  : 50.00 C

...
Detailed temperature information
----------------------------------------------------------------
Mbr/Slot-Sensor      : 1/1-PHY-01-04
Module Type          : line-card-module
Module Description   : JL659A 6300M 48SR5 CL6 PoE 4SFP56 Swch
Status               : normal
Fan-state            : normal
Current temperature  : 45.00 C
Minimum temperature  : 41.00 C
Maximum temperature  : 50.00 C

Mbr/Slot-Sensor      : 1/1-PHY-05-08
Module Type          : line-card-module
Module Description   : JL659A 6300M 48SR5 CL6 PoE 4SFP56 Swch
Status               : normal
Fan-state            : normal
Current temperature  : 45.00 C
Minimum temperature  : 41.00 C
Maximum temperature  : 50.00 C

...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show events

```
show events [ -e <EVENT-ID> |
    -s {emergency | alert | critical | error | warning | notice | info | debug} |
    -r |
    -a |
    -n <COUNT> |
    -i  <MEMBER-SLOT> |
    -m {active | standby} |
    -c {lldp | ospf | ...} |
    -d {lldpd | bgpd | fand | ...}]
```

### Description

Shows event logs generated by the switch modules since the last reboot.

| Parameter | Description |
|---|---|
| `-e <EVENT-ID>` | Shows the event logs for the specified event ID. Event ID range: 101 through 99999. |
| `-s {emergency \| alert \| critical \| error \| warning \| notice \| info \| debug}` | Shows the event logs for the specified severity. Select the severity from the following list:<br>■ `emergency`: Displays event logs with severity emergency only.<br>■ `alert`: Displays event logs with severity alert and above.<br>■ `critical`: Displays event logs with severity critical and above.<br>■ `error`: Displays event logs with severity error and above.<br>■ `warning`: Displays event logs with severity warning and above.<br>■ `notice`: Displays event logs with severity notice and above.<br>■ `info`: Displays event logs with severity info and above.<br>■ `debug`: Displays event logs with all severities. |
| `-r` | Shows the most recent event logs first. |
| `-a` | Shows all event logs, including those events from previous boots. |
| `-n <COUNT>` | Displays the specified number of event logs. |

| Parameter | Description |
|---|---|
| `-i` *`<MEMBER-SLOT>`* | On a 6400: Shows the event logs for the specified slot ID. |
| `-i` *`<MEMBER-SLOT>`* | On a 6300: Shows the event logs for the specified VSF member ID. |
| `-m {active \| standby}` | On a 6400: Shows the event logs for the specified management card role. Selecting `active` displays the event log for the AMM management card role and `standby` displays event logs for the SMM management card role. |
| `-m {active \| standby}` | On a 6300: Shows the event logs for the specified role. Selecting `active` displays the event log for the VSF conductor role and `standby` displays event logs for the VSF standby role. |
| `-c {lldp \| ospf \| ...}` | Shows the event logs for the specified event category. Enter `show event -c` for a full listing of supported categories with descriptions. |
| `-d {lldpd \| bgpd \| fand \| ...}` | Shows the event logs for the specified process. Enter `show event -d` for a full listing of supported daemons with descriptions. |

## Examples

Showing event logs:

```
switch# show events
---------------------------------------------------
show event logs
---------------------------------------------------
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
   70:72:cf:51:50:7c
2016-12-01:12:37:31.734541|intfd|4001|INFO|AMM|1|Interface port_admin set to
   up for bridge_normal interface
2016-12-01:12:37:32.583256|switchd|24002|ERR|AMM|1|Failed to create VLAN 1
   in Hardware
```

Showing the most recent event logs first:

```
switch# show events -r
---------------------------------------------------
show event logs
---------------------------------------------------
2016-12-01:12:37:32.583256|switchd|24002|ERR|AMM|1|Failed to create VLAN 1
   in Hardware
2016-12-01:12:37:31.734541|intfd|4001|INFO|AMM|1|Interface port_admin set to
   up for bridge_normal interface
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
   70:72:cf:51:50:7c
```

Showing all event logs:

```
switch# show events -a
---------------------------------------------------
```

```
show event logs
---------------------------------------------------
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
   70:72:cf:51:50:7c
2016-12-01:12:37:31.734541|intfd|4001|INFO|AMM|1|Interface port_admin set to
   up for bridge_normal interface
2016-12-01:12:37:32.583256|switchd|24002|ERR|AMM|1|Failed to create VLAN 1
   in Hardware
```

Showing event logs related to LACP:

```
switch# show events -c lacp
---------------------------------------------------
show event logs
---------------------------------------------------
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
   70:72:cf:51:50:7c
```

Showing event logs as per the specified management card role for a 6400 switch:

```
switch# show events -m active
---------------------------------------------------
show event logs
---------------------------------------------------
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
   70:72:cf:51:50:7c
2016-12-01:12:37:31.734541|intfd|4001|INFO|AMM|1|Interface port_admin set to
   up for bridge_normal interface
2016-12-01:12:37:32.583256|switchd|24002|ERR|AMM|1|Failed to create VLAN 1
   in Hardware
```

Showing event logs as per the specified member/slot ID:

```
switch# show events -i 1/1
---------------------------------------------------
show event logs
---------------------------------------------------
2017-08-17:22:32:25.743991|hpe-sysmond|6301|LOG_INFO|LC|1/1|System resource
   utilization poll interval is changed to 313
2017-08-17:22:33:01.692860|hpe-sysmond|6301|LOG_INFO|LC|1/1|System resource
   utilization poll interval is changed to 23
2017-08-17:22:33:06.181436|hpe-sysmond|6301|LOG_INFO|LC|1/1|System resource
   utilization poll interval is changed to 512
2017-08-17:22:33:06.181436|systemd-coredump|1201|LOG_CRIT|LC|1/1|hpe-sysmond
   crashed due to signal:11
```

Showing event logs as per the specified process:

```
switch# show events -d lacpd
---------------------------------------------------
show event logs
---------------------------------------------------
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
   70:72:cf:51:50:7c
```

Displaying the specified number of event logs:

```
switch# show events -n 5
---------------------------------------------------
show event logs
---------------------------------------------------
2018-03-21:06:12:15.500603|arpmgrd|6101|LOG_INFO|AMM|-|ARPMGRD daemon has started
2018-03-21:06:12:17.734405|lldpd|109|LOG_INFO|AMM|-|Configured LLDP tx-delay to 2
2018-03-21:06:12:17.740517|lacpd|1307|LOG_INFO|AMM|-|LACP system ID set to
   70:72:cf:d4:34:42
2018-03-21:06:12:17.743491|vrfmgrd|5401|LOG_INFO|AMM|-|Created a vrf entity
   42cc3df7-1113-412f-b5cb-e8227b8c22f2
2018-03-21:06:12:17.904008|vrfmgrd|5401|LOG_INFO|AMM|-|Created a vrf entity
   4409133e-2071-4ab8-adfe-f9662c06b889
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Auditors or Administrators or local user group members with execution rights for this command. Auditors can execute this command from the auditor context (auditor>) only. |

## show fabric

*Not supported on the 6300 Switch Series.*

`show fabric [<SLOT-ID>] [vsx-peer]`

### Description

Shows information about the installed fabrics.

| Parameter | Description |
|---|---|
| *<SLOT-ID>* | Specifies the member and slot of the fabric to show. For example, to show the module in member 1, slot 2, enter the following:<br>`1/2` |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing all fabrics on Aruba 6400 switches that have two fabrics:

```
switch# show fabric

Fabric Modules
==============

     Product                                    Serial
Name Number  Description                        Number     Status
---- ------- ---------------------------------  ---------- ----------------
1/1  R0X25A  6410 Chassis                       SG9ZKM9999 Ready
1/2  R0X25A  6410 Chassis                       SG9ZKM9999 Ready
```

Showing all fabrics on Aruba 6400 switches that have one fabric:

```
switch# show fabric

Fabric Modules
==============

     Product                                        Serial
Name Number  Description                            Number     Status
---- ------- -------------------------------------- ---------- ----------------
1/1  R0X24A  6405 Chassis                           SG9ZKM9076 Ready
```

Showing a single fabric module on Aruba 6400 switches:

```
switch# show fabric 1/1

Fabric module 1/1 is ready
Admin state: Up
Description: 6405 Chassis
Full Description: 6405 Chassis
Serial number: SG00000000
Product number: R0X24A
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show hostname

```
show hostname [vsx-peer]
```

### Description

Shows the current host name.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Setting and showing the host name:

```
switch# show hostname
switch
switch# config
switch(config)# hostname myswitch
myswitch(config)# show hostname
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show images

```
show images [vsx-peer]
```

### Description

Shows information about the software in the primary and secondary images.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

Showing the primary and secondary images on a 6300 switch:

```
switch(config)# show images
---------------------------------------------------------------------------
AOS-CX Primary Image
---------------------------------------------------------------------------
Version : FL.xx.xx.xxxx
Size    : 722 MB
Date    : 2019-10-22 17:00:46 PDT
SHA-256 : 4c84e49c0961fc56b5c7eab064750a333f1050212b7ce2fab587d13469d24cfa

---------------------------------------------------------------------------
 Primary Image
---------------------------------------------------------------------------
Version : FL.xx.xx.xxxx
Size    : 722 MB
Date    : 2019-10-22 17:00:46 PDT
SHA-256 : 4c84e49c0961fc56b5c7eab064750a333f1050212b7ce2fab587d13469d24cfa

---------------------------------------------------------------------------
AOS-CX Secondary Image
---------------------------------------------------------------------------
Version : FL.xx.xx.xxxx
Size    : 722 MB
Date    : 2019-10-22 17:00:46 PDT
SHA-256 : 4c84e49c0961fc56b5c7eab064750a333f1050212b7ce2fab587d13469d24cfa

Default Image : secondary

------------------------------------------------------
Management Module 1/1 (Active)
------------------------------------------------------
Active Image       : secondary
Service OS Version : FL.01.05.0001-internal
BIOS Version       : FL.01.0001
```

Showing the primary and secondary images on a 6400 switch:

```
switch(config)# show images
---------------------------------------------------------------------------
AOS-CX Primary Image
---------------------------------------------------------------------------
Version : FL.xx.xx.xxxxQ-2710-gd4ac39f30c9
Size    : 766 MB
Date    : 2019-10-30 17:22:01 PDT
SHA-256 : e560ca9141f425d19024d122573c5ff730df2a9a726488212263b45ea00382cf

---------------------------------------------------------------------------
AOS-CX Secondary Image
---------------------------------------------------------------------------
Version : FL.xx.xx.xxxx
Size    : 722 MB
Date    : 2019-10-21 19:36:26 PDT
SHA-256 : 657e28adc1b512217ce780e3523c37c94db3d3420231deac1ab9aaa8324dc6b9

Default Image : secondary

------------------------------------------------------
Management Module 1/1 (Active)
```

```
-----------------------------------------------------
Active Image       : secondary
Service OS Version : FL.01.05.0001-internal
BIOS Version       : FL.01.0001
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show ip errors

```
show ip errors [vsx-peer]
```

### Description

Shows IP error statistics for packets received by the switch since the switch was last booted.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

IP error info about received packets is collected from each active line card on the switch and is preserved during failover events. Error counts are cleared when the switch is rebooted.

Drop reasons are the following:

- **Malformed packet**
  The packet does not conform to TCP/IP protocol standards such as packet length or internet header length.
  A large number of malformed packets can indicate that there are hardware malfunctions such as loose cables, network card malfunctions, or that a DOS (denial of service) attack is occurring.
- **IP address error**
  The packet has an error in the destination or source IP address. Examples of IP address errors include the following:

- The source IP address and destination IP address are the same.
- There is no destination IP address.
- The source IP address is a multicast IP address.
- The forwarding header of an IPv6 address is empty.
- There is no source IP address for an IPv6 packet.

- **Invalid TTLs**
  The TTL (time to live) value of the packet reached zero. The packet was discarded because it traversed the maximum number of hops permitted by the TTL value.
  TTLs are used to prevent packets from being circulated on the network endlessly.

### Example

Showing ip error statistics for packets received by the switch:

```
switch# show ip errors
----------------------------------
Drop reason                Packets
----------------------------------
Malformed packets                1
IP address errors               10
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show module

`show module [<SLOT-ID>] [vsx-peer]`

### Description

Shows information about installed line modules and management modules.

| Parameter | Description |
|---|---|
| *<SLOT-ID>* | Specifies the member and slot numbers in format |

| Parameter | Description |
|---|---|
| | member/slot. For example, to show the module in member 1, slot 3, enter 1/3. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Usage

Identifies and shows status information about the line modules and management modules that are installed in the switch.

If you use the **<SLOT-ID>** parameter to specify a slot that does not have a line module installed, a message similar to the following example is displayed:

```
Module 1/4 is not physically present.
```

To show the configuration information—if any—associated with that line module slot, use the **show running-configuration** command.

Status is one of the following values:

Active
This module is the active management module.

Standby
This module is the standby management module.

Deinitializing
The module is being deinitialized.

Diagnostic
The module is in a state used for troubleshooting.

Down
The module is physically present but is powered down.

Empty
The module hardware is not installed in the chassis.

Failed
The module has experienced an error and failed.

Failover
This module is a fabric module or a line module, and it is in the process of connecting to the new active management module during a management module failover event.

Initializing
The module is being initialized.

Present
The module hardware is installed in the chassis.

Ready
The module is available for use.

Updating
A firmware update is being applied to the module.

## Examples

Showing all installed modules on a 6300 switch:

```
switch(config)# show module

Management Modules
==================
     Product                                        Serial
Name Number  Description                            Number     Status
---- ------- -------------------------------------- ---------- ----------------
1/1  JL659A  6300M 48SR5 CL6 PoE 4SFP56 Swch        ID9ZKHN090 Active (local)


Line Modules
============

     Product                                        Serial
Name Number  Description                            Number     Status
---- ------- -------------------------------------- ---------- ----------------
1/1  JL659A  6300M 48SR5 CL6 PoE 4SFP56 Swch        ID9ZKHN090 Ready

Management Modules
==================

     Product                                        Serial
Name Number  Description                            Number     Status
---- ------- -------------------------------------- ---------- ----------------
1/1  JL659A  6300M 48SR5 CL6 PoE 4SFP56 Swch        ID9ZKHN090 Active (local)


Line Modules
============

     Product                                        Serial
Name Number  Description                            Number     Status
---- ------- -------------------------------------- ---------- ----------------
1/1  JL659A  6300M 48SR5 CL6 PoE 4SFP56 Swch        ID9ZKHN090 Ready
```

Showing a line module on a 6400 switch:

```
switch# show module 1/3

Line module 1/3 is ready
 Admin state: Up
 Description: 6400 24p 10GT 4SFP56 Mod
 Full Description: 6400 24-port 10GBASE-T and 4-port SFP56 Module
 Serial number: SG9ZKMS045
 Product number: R0X42A
 Power priority: 128
```

Showing a slot that does not contain a line module:

```
switch(config)# show module 1/3
Module 1/3 is not physically present
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show running-config

`show running-config [<FEATURE>] [all] [vsx-peer]`

### Description

Shows the current nondefault configuration running on the switch. No user information is displayed.

| Parameter | Description |
|---|---|
| *<FEATURE>* | Specifies the name of a feature. For a list of feature names, enter the `show running-config` command, followed by a space, followed by a question mark (?). When the `json` parameter is used, the `vsx-peer` parameter is not applicable. |
| *all* | Shows all default values for the current running configuration. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing the current running configuration:

```
switch> show running-config
Current configuration:
!
!Version AOS-CX 10.0X.XXXX
!
lldp enable
linecard-module LC1 part-number JL363A
vrf green
!
!
!
!
!
!
aaa authentication login default local
aaa authorization commands default none
!
!
```

```
!
!
vlan 1
    no shutdown
vlan 20
    no shutdown
vlan 30
    no shutdown
interface 1/1/1
    no shutdown
    no routing
    vlan access 30
interface 1/1/32
    no shutdown
    no routing
    vlan access 20
interface bridge_normal-1
    no shutdown
interface bridge_normal-2
    no shutdown
interface vlan20
    no shutdown
    vrf attach green
    ip address 20.0.0.44/24
    ip ospf 1 area 0.0.0.0
    ip pim-sparse enable

interface vlan30
    no shutdown
    vrf attach green
    ip address 30.0.0.44/24
    ip ospf 1 area 0.0.0.0
    ip pim-sparse enable

    ip pim-sparse hello-interval 100
```

Showing the current running configuration in json format:

```
switch> show running-config json
Running-configuration in JSON:
{
    "Monitoring_Policy_Script": {
        "system_resource_monitor_mm1.1.0": {
            "Monitoring_Policy_Instance": {
                "system_resource_monitor_mm1.1.0/system_resource_monitor_
mm1.1.0.default": {
                    "name": "system_resource_monitor_mm1.1.0.default",
                    "origin": "system",
                    "parameters_values": {
                        "long_term_high_threshold": "70",
                        "long_term_normal_threshold": "60",
                        "long_term_time_period": "480",
                        "medium_term_high_threshold": "80",
                        "medium_term_normal_threshold": "60",
                        "medium_term_time_period": "120",
                        "short_term_high_threshold": "90",
                        "short_term_normal_threshold": "80",
                        "short_term_time_period": "5"
                    }
                }
            },
...
...
...
...
```

Show the current running configuration without default values:

```
switch(config)# show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
!
!
!
!
!
vlan 1
switch(config)# show running-config all
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
!
!
!
!
!
vlan 1
switch(config)#
```

Show the current running configuration with default values:

```
switch(config)# snmp-server vrf mgmt
switch(config)# show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
snmp-server vrf mgmt
!
!
!
!
!
vlan 1
switch(config)#
switch(config)#
switch(config)# show running-config all
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
snmp-server vrf mgmt
snmp-server agent-port 161
snmp-server community public
!
!
!
!
!
vlan 1
switch(config)#
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show running-config current-context

`show running-config current-context`

### Description

Shows the current non-default configuration running on the switch in the current command context.

### Usage

You can enter this command from the following configuration contexts:

- Any child of the global configuration (`config`) context. If the child context has instances—such as interfaces—you can enter the command in the context of a specific instance. Support for this command is provided for one level below the `config` context. For example, entering this command for a child of a child of the `config` context not supported. If you enter the command on a child of the `config` context, the current configuration of that context and the children of that context are displayed.

- The global configuration (`config`) context. If you enter this command in the global configuration (`config`) context, it shows the running configuration of the entire switch. Use the `show running-configuration` command instead.

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing the running configuration for the current interface:

```
switch(config-if)# show running-config current-context
interface 1/1/1
vsx-sync qos vlans
    no shutdown
    description Example interface
vlan access 1
    exit
```

Showing the current running configuration for the management interface:

```
switch(config-if-mgmt)# show running-config current-context
interface mgmt
    no shutdown
    ip static 10.0.0.1/24
    default-gateway 10.0.0.8
    nameserver 10.0.0.1
```

Showing the running configuration for the external storage share named `nasfiles`:

```
switch(config-external-storage-nasfiles)# show running-config current-context
external-storage nasfiles
   address 192.168.0.1
   vrf default
   username nasuser
   password ciphertext
AQBapalKj+XMsZumHEwIc9OR6YcOw5Z6Bh9rV+9ZtKDKzvbaBAAAAB1CTrM=
   type scp
   directory /home/nas
   enable
switch(config-external-storage-nasfiles)#
```

Showing the running configuration for a context that does not have instances:

```
switch(config-vsx)# show run current-context
vsx
    inter-switch-link 1/1/1
    role secondary
    vsx-sync sflow time
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` or a child of `config`. See Usage. | Administrators or local user group members with execution rights for this command. |

## show startup-config

```
show startup-config [json]
```

### Description

Shows the contents of the startup configuration.

Switches in the `factory-default` configuration do not have a startup configuration to display.

| Parameter | Description |
|---|---|
| **json** | Display output in JSON format. |

### Examples

Showing the startup-configuration in non-JSON format for a 6300 switch:

```
switch(config)# show startup-config
Startup configuration:
!
!Version AOS-CX FL.xx.xx.xxxx
!export-password: default
hostname BLDG01-F1
user admin group administrators password ciphertext

AQBapWl8I2ZunZ43NE/8KlbQ7zYC4gTT6uSFYi6n6wyY9PdBYgAAACONCR/3+AcNvzRBch0DoG7W9z84Lp
JA+6C9SKfNwCqi5/
nUPk/ZOvN91/EQXvPNkHtBtQWyYZqfkebbEH78VWRHfWZjApv4II9qmQfxpA79wEvzshdzZmuAKrm
user ateam group administrators password ciphertext

AQBapcPqMXoF+H10NKrqAedXLvlSRwf4wUEL22hXGD6ZBhicYgAAAGsbh70DKg1u+Ze1wxgmDXjkGO3bse
YiR3LKQg66vrfrqR/
M3oLlliPdZDnq9XMMvCL+7jBbYhYes8+uDxuSTh8kdkd/qj3lo5FUuC5fENgCjU0YI1l7qtU+YEnsj
!
!
!
!
radius-server host 10.10.10.15
!
radius dyn-authorization enable
ssh server vrf default
ssh server vrf mgmt
```

```
!
!
!
!
!
router ospf 1
    router-id 1.63.63.1
    area 0.0.0.0
vlan 1
vlan 66
    name vlan66
vlan 67
    name vlan67
vlan 999
    name vlan999
vlan 4000
spanning-tree
interface mgmt
    no shutdown
    ip static 10.6.9.15/24
    default-gateway 10.6.9.1
```

Showing the startup-configuration in JSON format:

```
switch# show startup-config json
Startup configuration:
{
    "AAA_Server_Group": {
        "local": {
            "group_name": "local"
        },
        "none": {
            "group_name": "none"
        }
    },
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show system error-counter-monitor

```
show system error-counter-monitor {basic <PORT-NUM> | extended} [vsx-peer]
```

## Description

Shows error counter statistics.

| Parameter | Description |
|---|---|
| `basic <PORT-NUM>` | Specifies a physical port on the switch. Use the format `member/slot/port` (for example, `1/3/1`). |
| `extended` | Shows statistics for all interfaces. |

## Examples

Showing error counter statistics for interface 1/1/1:

```
switch# show system error-counter-monitor basic 1/1/1

Interface error counter statistics for 1/1/1

Error Counter                      Value
-----------------------------------------
EtherStatsOversizePkts             983
EtherStatsUndersizePkts            1024
EtherStatsJabbers                  10
Dot3StatsAlignmentErrors           462
Dot3StatsFCSErrors                 321
Dot3StatsLateCollisions            2024
EtherStatsFragments                121
Dot3StatsExcessiveCollisions       1025
IfInBroadcastPkts                  2001
```

Showing error counter statistics for all interfaces:

```
switch# show system error-counter-monitor extended

Interface error counter statistics for 1/1/1

Error Counter                      Value
-----------------------------------------
EtherStatsOversizePkts             983
EtherStatsUndersizePkts            1024
EtherStatsJabbers                  10
Dot3StatsAlignmentErrors           462
Dot3StatsFCSErrors                 321
Dot3StatsLateCollisions            2024
EtherStatsFragments                121
Dot3StatsExcessiveCollisions       1025
IfInBroadcastPkts                  2001
...
...
Interface error counter statistics for 1/8/32

Error Counter                     Value
-----------------------------------------
EtherStatsOversizePkts             0
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show system

`show system [serviceos password-prompt] [vsx-peer]`

### Description

Shows general status information about the system.

| Parameter | Description |
|---|---|
| `serviceos password-prompt` | Shows the Service OS password prompt status. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Usage

CPU utilization represents the average utilization across all the CPU cores.

System Description, System Contact, and System Location can be set with the `snmp-server` command.

When `vsx-peer` is specified, the `Up Time` value is not shown because it is not synchronized between VSX peers.

### Examples

Showing system information:

```
switch# show system
Hostname                : switch
System Description      : switch description
System Contact          : contact
System Location         : location

Vendor                  : Aruba
Product Name            : Xxxxxx ...
```

```
Chassis Serial Nbr      : XXXXXXXXXX
Base MAC Address        : xxxxxx-xxxxxx
AOS-CX Version          : XX.99.99.9999

Time Zone               : UTC

Up Time                 : 1 week, 5 hours, 28 minutes
CPU Util (%)            : 5
CPU Util (% avg 1 min)  : 11
CPU Util (% avg 5 min)  : 10
Memory Usage (%)        : 35
```

Showing the Service OS password prompt status:

```
switch# show system serviceos password-prompt
password-prompt: disabled
```

Showing system information for a VSX primary and secondary (peer) switch:

```
switch# show system
Hostname                : vsx-primary
System Description      : switch description
System Contact          : contact
System Location         : location

Vendor                  : Aruba
Product Name            : Xxxxxx ...
Chassis Serial Nbr      : XXXXXXXXXX
Base MAC Address        : xxxxxx-xxxxxx

Hostname                : vsx-primary
System Description      : switch description
System Contact          : contact
System Location         : location

Vendor                  : Aruba
Product Name            : Xxxxxx ...
Chassis Serial Nbr      : XXXXXXXXXX
Base MAC Address        : xxxxxx-xxxxxx
AOS-CX Version          : XX.99.99.9999

Time Zone               : UTC

Up Time                 : 1 week, 2 hours, 15 minutes
CPU Util (%)            : 15
CPU Util (% avg 1 min)  : 12
CPU Util (% avg 5 min)  : 8
Memory Usage (%)        : 37


switch# show system vsx-peer
Hostname                : vsx-secondary
System Description      : switch description
System Contact          : contact
System Location         : location

Vendor                  : Aruba
Product Name            : Xxxxxx ...
Chassis Serial Nbr      : XXXXXXXXXX
```

```
Base MAC Address        : xxxxxx-xxxxxx
AOS-CX Version          : XX.99.99.9999

Time Zone               : UTC

CPU Util (%)            : 7
CPU Util (% avg 1 min)  : 13
CPU Util (% avg 5 min)  : 9
Memory Usage (%)        : 32
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12 | Added `CPU Util (% avg 1 min)` and `CPU Util (% avg 5 min)`. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show system resource-utilization

Applies to the 6300 Switch Series:

```
show system resource-utilization [all | daemon <DAEMON-NAME>] |
     standby | member <MEMBER-NUM>] [vsx-peer]
```

Applies to the 6400 Switch Series:

```
show system resource-utilization [all | daemon <DAEMON-NAME>] |
     standby | module <SLOT-ID>] [vsx-peer]
```

### Description

Shows the system resource utilization data.

| Parameter | Description |
|---|---|
| `all` | Shows the resource utilization data for the entire switch. |
| `daemon <DAEMON-NAME>` | Shows only the resource utilization data for the process identified by *<DAEMON-NAME>*. |
| `standby` | Shows only the resource utilization data for the standby management module. |

| Parameter | Description |
|---|---|
| `member <MEMBER-NUM>` | (Applies to the 6300 Switch Series.) Shows only the resource utilization data for the VSF member identified by *<MEMBER-NUM>*. |
| `module <SLOT-ID>` | (Applies to the 6400 Switch Series.) Shows only the resource utilization data for the line module identified by *<SLOT-ID>*. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Usage

For a list of daemons that log events, enter `show events -d ?` from a switch prompt in the manager (`#`) context.

## Examples

Showing system resource utilization data:

```
switch# show system resource-utilization
System Resources:
Processes                            :  144
CPU usage(%)                         :   10
CPU usage(% average over 1 minute)   :   11
CPU usage(% average over 5 minute)   :   15
Memory usage(%)                      :   22
Open FD's                            : 1358
Storage 1: Endurance utilization = 10-20% (mmc-type-a), 0-10% (mmc-type-b),
   Health = normal

Data written to various partitions since boot
Nos      :    5 MB
Log      :    1 MB
Coredump :   23 MB
Security :    2 MB
Selftest :  405 KB
Swap     :   14 MB

Storage partition usage(%)
Nos      :    5
Log      :   60
Coredump :   23
Security :    2
Selftest :    1
Swap     :    0

Process                  CPU Usage(%)     Memory Usage(%)    Open FD's
--------------------------------------------------------------------------
hpe-sysmond                  1                 2                 11
hpe-mgmdd                    0                 1                 5
...
```

Attempting to show resource utilization data when system resource utilization polling is disabled:

```
switch# show system resource-utilization
System resource utilization data poll is currently disabled
```

Showing the resource utilization data for a particular process:

```
switch# show system resource-utilization daemon hpe-sysmond
Process                 CPU Usage(%)    Memory Usage(%)   Open FD's
--------------------------------------------------------------------------
hpe-sysmond                 1                2                11
```

(Applies to the 6300 Switch Series.) Showing resource utilization data for all VSF members:

```
aaa
```

(Applies to the 6300 Switch Series.) Showing resource utilization data for a particular VSF member:

```
switch# show system resource-utilization member 2
--------------------------------------------------------------------------
Resource utilization data for vsf member 2
--------------------------------------------------------------------------

System Resources:
Processes                          :  244
CPU usage(%)                       :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                    :   11
Open FD's                          : 1854
Storage 1: Endurance utilization = 0-10% (mmc-type-a), 0-10% (mmc-type-b),
   Health = normal

Data written to various partitions since boot
Nos      :  15 MB
Log      :   1 MB
Coredump :  23 MB
Security :   2 MB
Selftest :   0 KB
Swap     :   0 MB

Storage partition usage(%)
Nos      :   5
Log      :  60
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

Process                 CPU Usage(%)    Memory Usage(%)   Open FD's
--------------------------------------------------------------------------
(sd-pam)                    0               0               7
agetty                      0               0               4
ata_sff                     0               0               0
...
```

```
switch# show system resource-utilization all
--------------------------------------------------------------------------
Resource utilization data for vsf member 1
--------------------------------------------------------------------------

System Resources:
Processes                          :  244
CPU usage(%)                       :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                    :   11
Open FD's                          : 1854
Storage 1: Endurance utilization = 0-10% (mmc-type-a), 0-10% (mmc-type-b),
   Health = normal

Data written to various partitions since boot
Nos      :  15 MB
Log      :   1 MB
Coredump :  23 MB
Security :   2 MB
Selftest : 405 KB
Swap     :  14 MB

Storage partition usage(%)
Nos      :   5
Log      :  60
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

Process                 CPU Usage(%)    Memory Usage(%)   Open FD's
--------------------------------------------------------------------------
(sd-pam)                0               0               7
aaa
utilspamcfg          0               1               10
--------------------------------------------------------------------------
Resource utilization data for vsf member 2
--------------------------------------------------------------------------

System Resources:
Processes                          :  244
CPU usage(%)                       :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                    :   11
Open FD's                          : 1854
Storage 1: Endurance utilization = 0-10% (mmc-type-a), 0-10% (mmc-type-b),
   Health = normal

Data written to various partitions since boot
Nos      :  15 MB
Log      :   1 MB
Coredump :  23 MB
Security :   2 MB
Selftest :   0 KB
Swap     :   0 MB

Storage partition usage(%)
Nos      :   5
Log      :  60
```

```
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

Process                  CPU Usage(%)    Memory Usage(%)   Open FD's
--------------------------------------------------------------------------
(sd-pam)                     0               0               7
agetty                       0               0               4
ata_sff                      0               0               0
```

(Applies to the 6400 Switch Series.) Showing resource utilization data for the standby management module:

```
switch# show system resource-utilization standby
System Resources:
Processes                          :  244
CPU usage(%)                       :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                    :   11
Open FD's                          : 1854
Storage 1: Endurance utilization = 10-20% (mmc-type-a), 0-10% (mmc-type-b)
   Health = normal

Data written to various partitions since boot
Nos      :  15 MB
Log      :   1 MB
Coredump :  23 MB
Security :   2 MB
Selftest : 405 KB
Swap     :  14 MB

Storage partition usage(%)
Nos      :   5
Log      :  60
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

Process                  CPU Usage(%)    Memory Usage(%)   Open FD's
--------------------------------------------------------------------------
hpe-sysmond                  1                2                 11
hpe-mgmdd                    0                1                 5
...
```

(Applies to the 6400 Switch Series.) Showing resource utilization data for a line module:

```
switch# show system resource-utilization module 1/5
--------------------------------------------------------------------------
System Resource utilization for line card module: 1/5
--------------------------------------------------------------------------
CPU usage(%)                       :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                    :   11
Open FD's                          :  754
```

(Applies to the 6400 Switch Series.) Showing resource utilization data for all modules:

```
switch# show system resource-utilization all
--------------------------------------------------------------------------
Resource utilization data for Management Module
--------------------------------------------------------------------------

System Resources:
Processes                          :  244
CPU usage(%)                       :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                    :   11
Open FD's                          : 1854
Storage 1: Endurance utilization = 10-20% (mmc-type-a), 0-10% (mmc-type-b),
   Health = normal

Data written to various partitions since boot
Nos      :  15 MB
Log      :   1 MB
Coredump :  23 MB
Security :   2 MB
Selftest : 405 KB
Swap     :  14 MB

Storage partition usage(%)
Nos      :   5
Log      :  60
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

Process                 CPU Usage(%)    Memory Usage(%)   Open FD's
--------------------------------------------------------------------------
(sd-pam)                0               0               7
aaa
utilspamcfg          0               1               10

--------------------------------------------------------------------------
Resource utilization data for Standby Management Module
--------------------------------------------------------------------------

System Resources:
Processes                          :  244
CPU usage(%)                       :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                    :   11
Open FD's                          : 1854
Storage 1: Endurance utilization = 10-20% (mmc-type-a), 0-10% (mmc-type-b),
   Health = normal

Data written to various partitions since boot
Nos      :  15 MB
```

```
Log      :   1 MB
Coredump :  23 MB
Security :   2 MB
Selftest : 405 KB
Swap     :   0 KB

Storage partition usage(%)
Nos      :   5
Log      :  60
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

--------------------------------------------------------------------------
System Resource utilization for line card module: 1/7
--------------------------------------------------------------------------
CPU usage(%)                          :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                       :   11
Open FD's                             :  854

--------------------------------------------------------------------------
System Resource utilization for line card module: 1/8
--------------------------------------------------------------------------
CPU usage(%)                          :   10
CPU usage(% average over 1 minute) :   11
CPU usage(% average over 5 minute) :   15
Memory usage(%)                       :   11
Open FD's                             :  980
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12 | The output of this command includes **CPU usage(% average over 1 minute)** and **CPU usage(% average over 5 minute)**. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show tech

```
show tech [basic | <FEATURE>] [local-file]
```

## Description

Shows detailed information about switch features by automatically running the `show` commands associated with the feature. If no parameters are specified, the `show tech` command shows information about all switch features. Technical support personnel use the output from this command for troubleshooting.

| Parameter | Description |
|---|---|
| `basic` | Specifies showing a basic set of information. |
| *`<FEATURE>`* | Specifies the name of a feature. For a list of feature names, enter the `show tech` command, followed by a space, followed by a question mark (?). |
| `local-file` | Shows the output of the `show tech` command to a local text file. |

## Usage

To terminate the output of the `show tech` command, enter **Ctrl+C**.

If the command was not terminated with **Ctrl+C**, at the end of the output, the `show tech` command shows the following:

- The time consumed to execute the command.
- The list of failed `show` commands, if any.

To get a copy of the local text file content created with the show tech command that is used with the local-file parameter, use the `copy show-tech local-file` command.

## Example

Showing the basic set of system information:

```
switch# show tech basic
=============================================================
Show Tech executed on Wed Sep  6 16:50:37 2017
=============================================================
=============================================================
[Begin] Feature basic
=============================================================

*******************************
Command : show core-dump all
*******************************
no core dumps are present

...
=============================================================
[End] Feature basic
=============================================================

=============================================================
1 show tech command failed
=============================================================
Failed command:
  1. show boot-history
=============================================================
Show tech took 3.000000 seconds for execution
```

Directing the output of the **show tech basic** command to the local text file:

```
switch# show tech basic local-file
Show Tech output stored in local-file. Please use 'copy show-tech local-file'
to copy-out this file.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show usb

```
show usb [vsx-peer]
```

### Description

Shows the USB port configuration and mount settings.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

If USB has not been enabled:

```
switch> show usb
Enabled: No
Mounted: No
```

If USB has been enabled, but no device has been mounted:

```
switch> show usb
Enabled: Yes
Mounted: No
```

If USB has been enabled and a device mounted:

```
switch> show usb
Enabled: Yes
Mounted: Yes
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show usb file-system

```
show usb file-system [<PATH>]
```

### Description

Shows directory listings for a mounted USB device. When entered without the <PATH> parameter the top level directory tree is shown.

| Parameter | Description |
|---|---|
| *<PATH>* | Specifies the file path to show. A leading "/" in the path is optional. |

### Usage

Adding a leading "/" as the first character of the *<PATH>* parameter is optional.

Attempting to enter '..' as any part of the *<PATH>* will generate an invalid path argument error. Only fully-qualified path names are supported.

### Examples

Showing the top level directory tree:

```
switch# show usb file-system
/mnt/usb:
'System Volume Information'  dir1'
```

```
/mnt/usb/System Volume Information':
IndexerVolumeGuid  WPSettings.dat

/mnt/usb/dir1:
dir2  test1

/mnt/usb/dir1/dir2:
test2
```

Showing available path options from the top level:

```
switch# show usb file-system /
total 64
drwxrwxrwx 2 32768 Jan 22 16:27 'System Volume Information'
drwxrwxrwx 3 32768 Mar  5 15:26 dir1
```

Showing the contents of a specific folder:

```
switch# show usb file-system /dir1
total 32
drwxrwxrwx 2 32768 Mar  5 15:26 dir2
-rwxrwxrwx 1     0 Feb  5 18:08 test1

switch# show usb file-system dir1/dir2
total 0
-rwxrwxrwx 1 0 Feb  6 05:35 test2
```

Attempting to enter an invalid character in the path:

```
switch# show usb file-system dir1/../..
Invalid path argument
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show version

```
show version [vsx-peer]
```

### Description

Shows version information about the network operating system software, service operating system software, and BIOS.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

Showing version information for a 6300 switch:

```
6300# show version
-----------------------------------------------------------------------------
ArubaOS-CX
(c) Copyright 2017-2022 Hewlett Packard Enterprise Development LP
-----------------------------------------------------------------------------
Version      : FL.10.10.0001BJ
Build Date   : 2022-05-25 10:22:06 UTC
Build ID     : ArubaOS-CX:FL.10.10.0001BJ:16d4d3ca52e9:202205908
Build SHA    : 16d4d349695b50298f34b21a8c67637ae0
Hot Patches  : hpe-routing_FL_10_10_0001BJ.patch
Active Image : primary

Service OS Version : FL.01.11.0001-internal
BIOS Version       : FL.01.0004
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## system resource-utilization poll-interval

```
system resource-utilization poll-interval <SECONDS>
```

### Description

Configures the polling interval for system resource information collection and recording such as CPU and memory usage.

| Parameter | Description |
|---|---|
| *<SECONDS>* | Specifies the poll interval in seconds. Range: 10-3600. Default: 10. |

### Example

Configuring the system resource utilization poll interval:

```
switch(config)# system resource-utilization poll-interval 20
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## top cpu

`top cpu`

### Description

Shows CPU utilization information.

### Example

Showing top CPU information:

```
switch# top cpu
top - 09:42:55 up 3 min, 3 users, load average: 3.44, 3.78, 1.70
Tasks:  76 total, 2 running, 74 sleeping,  0 stopped,  0 zombie
%Cpu(s): 31.4 us, 32.7 sy, 0.5 ni, 34.4 id, 04. wa, 0.0 hi, 0.6 si, 0.0 st
KiB Mem : 4046496 total,  2487508 free,  897040 used,   661948 buff/cache
KiB Swap:       0 total,        0 free,       0 used,  2859196 avail Mem

  PID USER     PRI  NI   VIRT    RES   SHR S  %CPU %MEM      TIME+ COMMAND
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# top memory

`top memory`

## Description

Shows memory utilization information.

## Example

Showing top memory:

```
switch> top memory
top - 09:42:55 up 3 min, 3 users, load average: 3.44, 3.78, 1.70
Tasks:  76 total, 2 running, 74 sleeping,  0 stopped,  0 zombie
%Cpu(s): 31.4 us, 32.7 sy, 0.5 ni, 34.4 id, 04. wa, 0.0 hi, 0.6 si, 0.0 st
KiB Mem : 4046496 total,  2487508 free,  897040 used,   661948 buff/cache
KiB Swap:       0 total,        0 free,       0 used,  2859196 avail Mem

  PID USER     PRI  NI   VIRT    RES   SHR S  %CPU %MEM      TIME+ COMMAND
...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# usb

```
usb
no usb
```

### Description

Enables the USB ports on the switch. This setting is persistent across switch reboots and management module failovers. Both active and standby management modules are affected by this setting.

The **no** form of this command disables the USB ports.

### Example

Enabling USB ports:

```
switch(config)# usb
```

Disabling USB ports when a USB drive is mounted:

```
switch(config)# no usb
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# usb mount | unmount

```
usb {mount | unmount}
```

### Description

Enables or disables the inserted USB drive.

| Parameter | Description |
|---|---|
| `mount` | Enables the inserted USB drive. |
| `unmount` | Disables the inserted USB drive in preparation for removal. |

## Usage

If USB has been enabled in the configuration, the USB port on the active management module is available for mounting a USB drive. The USB port on the standby management module is not available.

An inserted USB drive must be mounted each time the switch boots or fails over to a different management module.

A USB drive must be unmounted before removal.

The supported USB file systems are FAT16 and FAT32.

## Examples

Mounting a USB drive in the USB port:

```
switch# usb mount
```

Unmounting a USB drive:

```
switch# usb unmount
```

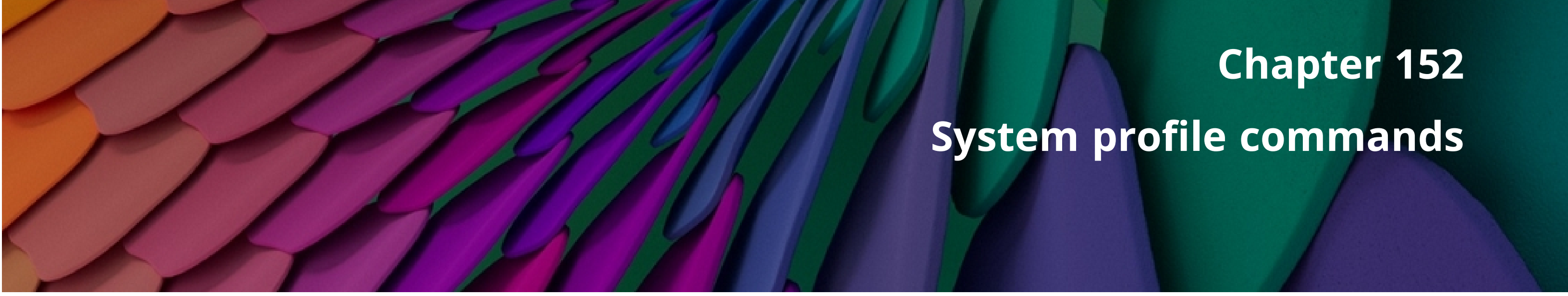
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 152

# System profile commands

## profile

```
profile <PROFILE-NAME>
no profile [<PROFILE-NAME>]
```

### Description

Selects the system profile. System profiles set the overall capabilities and capacities of the switch based on the selected profile used at boot time. Switch profiles set capacities such as that of the hardware forwarding table. Use command show profiles available to show the details of each available profile.

> When a switch is configured with a non-default profile, the switch requires a reboot for the profile to be applied. You are prompted for the reboot.

The no form of this command resets the specified profile to its defaults.

| Profile names | Description |
|---|---|
| `default` | Selects the original default. v1 and v2 modules supported. |
| `v2-default` | (The default.) Selects the v2 default. Only v2 modules are supported. |
| `v2-Aggregation-High-Bandwidth` | Selects aggregation high bandwidth. Only R0X44C (1G/10G/25G) and R0X45C (40G/100G) v2 modules are supported. |
| `v2-Core-High-Bandwidth` | Selects core high bandwidth. Only R0X44C (1G/10G/25G) and R0X45C (40G/100G) v2 modules are supported. |
| `v2-Leaf-Extended-High-Bandwidth` | Selects leaf extended high bandwidth. Only R0X44C (1G/10G/25G) and R0X45C (40G/100G) v2 modules are supported. |

### Examples

Selecting the v2-Aggregation-High-Bandwidth profile and then rebooting the system:

```
switch(config)# profile v2-Aggregation-High-Bandwidth
switch(config)# exit
switch# boot system
switch(config)# The config will be cleared, and the switch will be
   rebooted with the v2-Aggregation-High-Bandwidth profile
Continue(y/n)...
```

Selecting the default profile and then rebooting the system:

```
switch(config)# profile default
switch(config)# exit
switch# boot system
switch(config)# The config will be cleared, and the switch will be
   rebooted with the Default profile
Continue(y/n)...
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced on the 6400. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

## show profiles available

`show profiles available`

### Description

Shows all system profile names available and profile details.

### Examples

Showing all available profiles:

```
switch# show profiles available

Available Profiles
-------------------
Default                v1 and v2 modules supported
                       32768 L2 entries, 49152 Host entries, 65536 Route entries
v2-Aggregation-        Only R0X44C(1G/10G/25G)& R0X45C(40G/100G)v2 modules
supported
  High-Bandwidth       114688 L2 entries, 163840 Host entries, 65536 Route entries
                       enhanced feature set
v2-Core-High-Bandwidth Only R0X44C(1G/10G/25G)& R0X45C(40G/100G)v2 modules
supported
                       32768 L2 entries, 65536 Host entries, 630784 Route entries
                       enhanced feature set
v2-Default             Only v2 modules supported (Default)
                       32768 L2 entries, 49152 Host entries, 65536 Route entries
                       enhanced feature set
                       (Default)
```

```
v2-Leaf-Extended-      Only R0X44C(1G/10G/25G)& R0X45C(40G/100G)v2 modules
supported
  High-Bandwidth       212992 L2 entries, 16384 Host entries, 65536 Route entries
                       enhanced feature set

Note: Not all profiles are supported by all the modules, in order for the profile
to
      perform as expected, the profile must be supported by the module.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced on the 6400. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show profile current

```
show profile current
```

### Description

Shows the current system profile.

### Examples

Showing the current profile:

```
switch# show profile current

Current profile
-------------------
v2-Aggregation-High-Bandwidth
```

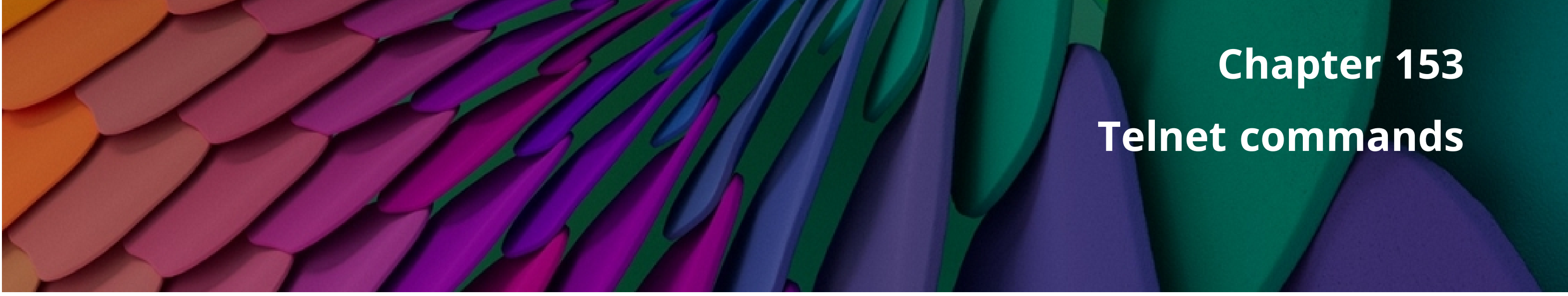
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced on the 6400. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 153

# Telnet commands

## show telnet server

`show telnet server`

### Description

Shows the Telnet server configuration.

### Examples

Showing the Telnet server configuration:

```
switch(config)# show telnet server
TELNET Server Configuration:

    IP Version          : IPv4
    TCP Port            : 23
    Enabled VRFs        : default, vrf1, vrf2,
                          red, green
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08.1021 | Command introduced on the 6200, 6300, 6400 Switch Series. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show telnet server sessions

`show telnet server sessions [vrf <VRF-NAME> | all-vrfs]`

### Description

Shows all active Telnet sessions for the specified VRF or all VRFs. If no VRF is provided, the Telnet sessions on the **default** VRF are shown.

| Parameter | Description |
|---|---|
| `vrf <VRF-NAME>` | Specifies the Telnet sessions for a specific VRF. |
| `all-vrfs` | Specifies the Telnet sessions for all VRFs |

### Examples

Showing the Telnet session on the **default** VRF:

```
switch(config)# show telnet server sessions
TELNET sessions on VRF default:

    IPv4 TELNET Sessions:
        Server IP         : 10.1.1.1
        Client IP         : 10.1.1.2
        Client Port       : 58835
```

Showing the Telnet sessions on all VRFs:

```
switch(config)# show telnet server sessions all-vrfs
TELNET sessions on VRF mgmt:

    IPv4 TELNET Sessions:
        Server IP         : 10.1.1.1
        Client IP         : 10.1.1.2
        Client Port       : 58835

TELNET sessions on VRF default:

    IPv4 TELNET Sessions:
        Server IP         : 20.1.1.1
        Client IP         : 20.1.1.2
        Client Port       : 58837
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08.1021 | Command introduced on the 6200, 6300, 6400 Switch Series. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## telnet server

```
telnet server vrf <VRF-NAME>
no telnet server vrf <VRF-NAME>
```

### Description

Enables the Telnet server on the desired VRF. Telnet server is disabled by default.

The **no** form of this command disables the Telnet server.

| Parameter | Description |
|---|---|
| `vrf <VRF-NAME>` | Specifies the VRF on which the Telnet server will be enabled or disabled. |

### Examples

Configuring the Telnet server on the **mgmt** VRF:

```
switch(config)# telnet server vrf mgmt
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08.1021 | Command introduced on the 6200, 6300, 6400 Switch Series. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# Chapter 154

# Terminal monitor commands

## logging console {notify | severity | filter}

`logging console{notify <event|debug|all> | severity <level> | filter keyword}`

`no logging console`

### Description

Enables the logging console feature in the console session. It display all debug log or event log or both debug and event log messages. Monitoring can be filtered with the severity options or with the help of keywords. Enabling terminal monitor without options displays both debug and event log with a severity error. This command is persistent across reboot.

The **no** form of this command disables the terminal monitor configuration.

| Parameter | Description |
|---|---|
| `notify <event|debug|all>` | Specifies the type of log notification.<br>■ **Event:** Displays the event log messages. (Default)<br>■ **Debug:** Displays the debug log messages.<br>■ **All:** Displays both event and debug log messages. |
| `severity <level>` | Specifies the severity level for the logs. The different severity levels are emergency, critical, error, warning, notice, information (default), alert, and debug (shows all severities). |
| `filter <keyword>` | Specifies the filter by applying keyword for the logs. |

### Authority

Administrators or local user group members with execution rights for this command.

### Examples

Configuring console logging in the console session:

```
switch(config)# logging console
Terminal-monitor is enabled successfully

switch(config)# logging console notify all
Terminal-monitor is enabled successfully

switch(config)# logging console notify event severity info
Terminal-monitor is enabled successfully

switch(config)# logging console filter lldp
Terminal-monitor is enabled successfully
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Feature introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show terminal-monitor

`show terminal-monitor`

### Description

Shows whether the terminal monitoring is enabled or disabled.

This command will not show any information about console logging.

### Examples

Displaying terminal monitor when enabled:

```
switch# show terminal-monitor

Terminal-monitor is enabled
-------------------------------------
Notify     | Severity   | Filter
-------------------------------------
event        debug        lldp
-------------------------------------
```

Displaying terminal monitor when disabled:

```
switch# show terminal-monitor

Terminal-monitor is disabled
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## terminal-monitor {notify | severity | filter}

```
terminal-monitor {notify <event|debug|all> | severity <level> | filter <keyword>}
```

```
no terminal-monitor
```

### Description

Enables and saves the terminal monitor feature in the switch configuration. It displays all debug log or event log or both debug and event log messages. Terminal monitoring can be filtered with the severity options or with the help of keywords. Enabling terminal monitor without options displays both debug and event log with a severity error.

The **no** form of this command removes the terminal monitor feature from the switch configuration and the command will not persist.

| Parameter | Description |
|---|---|
| `notify <event\|debug\|all>` | Specifies the type of log notification.<br>■ **Event:** Displays the event log messages. (Default)<br>■ **Debug:** Displays the debug log messages.<br>■ **All:** Displays both event and debug log messages. |
| `severity <level>` | Specifies the severity level for the logs. The different severity levels are emergency, critical, error, warning, notice, information (default), alert, and debug (shows all severities). |
| `filter <keyword>` | Specifies the filter by applying keyword for the logs. |

### Authority

Administrators or local user group members with execution rights for this command.

### Examples

Enabling terminal monitor:

```
switch# terminal-monitor
Terminal-monitor is enabled successfully

switch# terminal-monitor notify all
Terminal-monitor is enabled successfully

switch# terminal-monitor notify event severity info
```

```
Terminal-monitor is enabled successfully

switch# terminal-monitor filter lldp
Terminal-monitor is enabled successfully
```

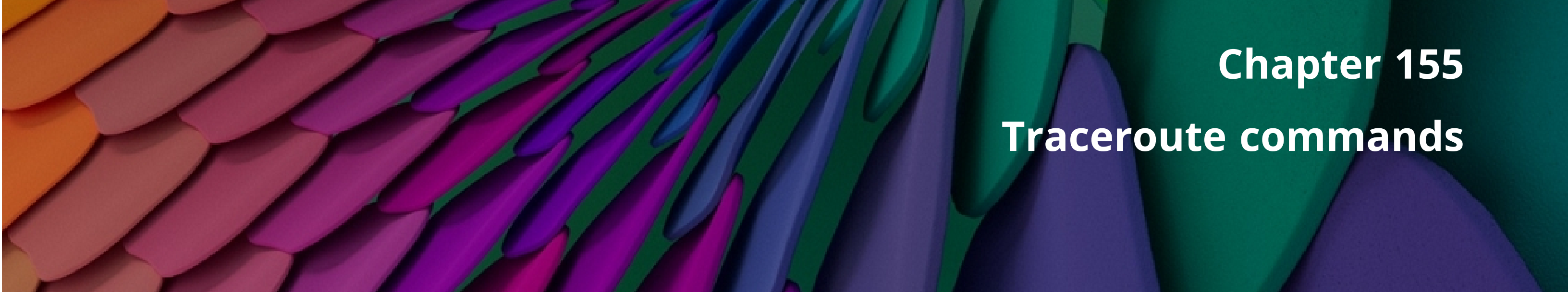
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 155

# Traceroute commands

## traceroute

```
traceroute {<IPV4-ADDR> | <HOSTNAME>} [ip-option loosesourceroute <IPV4-ADDR>] [dstport
<NUMBER> | maxttl <NUMBER> | minttl <NUMBER> | probes <NUMBER> | timeout <TIME>] [vrf
<VRF-NAME>] source {<IPV4-ADDR> | <IFNAME>}
```

Traceroute over VXLAN with `ip-option loosesourceroute` on L3VNI is not supported.

### Description

Uses traceroute for the specified IPv4 address or hostname with or without optional parameters.

| Parameter | Description |
|---|---|
| `IPv4-address <IPV4-ADDR>` | Specifies the IPv4 address. |
| `hostname` | Specifies the hostname of the device to traceroute. |
| `ip-option` | Specifies the IP option. |
| `loosesourceroute <IPV4-ADDR>` | Specifies the route for loose source record route. Enter one or more intermediate router IP addresses separated by ',' for loose source routing. |
| `dstport <NUMBER>` | Specifies the destination port, <*1-34000*>. Default: 33434 |
| `maxttl <NUMBER>` | Specifies the maximum number of hops to reach the destination, <*1-255*>. Default: 30 |
| `minttl <NUMBER>` | Specifies the Minimum number of hops to reach the destination, <*1-255*>. Default: 1 |
| `probes <NUMBER>` | Specifies the number of probes, <*1-5*>. Default: 3 |
| `timeout <TIME>` | Specifies the traceroute timeout in seconds, <*1-60*>. Default: 3 seconds |
| `vrf <VRF-NAME>` | Specifies the virtual routing and forwarding (VRF) to use . |
| `source {<IPV4-ADDR> \| <IFNAME>}` | Specifies the source IPv4 address or interface name. |

### Usage

Traceroute is a computer network diagnostic tool for displaying the route (path), and measuring transit delays of packets across an Internet Protocol (IP) network. It sends a sequence of User Datagram Protocol (UDP) packets addressed to a destination host. The time-to-live (TTL) value, also known as hop limit, is used in determining the intermediate routers being traversed towards the destination.

### Examples

```
switch# traceroute 10.0.10.1
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 30 hops max, 3 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute localhost
traceroute to localhost (127.0.0.1), 1 hops min, 30 hops max, 3 sec. timeout, 3
probes
  1   127.0.0.1  0.018ms  0.006ms  0.003ms

switch# traceroute 10.0.10.1 maxttl 20
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 20 hops max, 3 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute 10.0.10.1 minttl 1
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 30 hops max, 3 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute 10.0.10.1 dstport 33434
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 30 hops max, 3 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute 10.0.10.1 probes 2
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 30 hops max, 3 sec. timeout, 2
probes
  1   10.0.40.2  0.002ms  0.002ms
  2   10.0.30.1  0.002ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms

switch# traceroute 10.0.10.1 timeout 5
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 30 hops max, 5 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute localhost vrf red
traceroute to localhost (127.0.0.1), 1 hops min, 30 hops max, 3 sec. timeout, 3
probes
  1   127.0.0.1  0.003ms  0.002ms  0.001ms

switch# traceroute localhost mgmt
traceroute to localhost (127.0.0.1), 1 hops min, 30 hops max, 3 sec. timeout, 3
probes
  1   127.0.0.1  0.018ms  0.006ms  0.003ms

switch# traceroute 10.0.10.1 maxttl 20 timeout 5 minttl 1 probes 3 dstport 33434
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 20 hops max, 5 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute 10.0.10.1 ip-option loosesourceroute 10.0.40.2
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 30 hops max, 3 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute 10.0.10.1 ip-option loosesourceroute 10.0.40.2 maxttl 20
timeout 5 minttl 1 probes 3 dstport 33434
traceroute to 10.0.10.1 (10.0.10.1) , 1 hops min, 20 hops max, 5 sec. timeout, 3
probes
  1   10.0.40.2  0.002ms  0.002ms  0.001ms
  2   10.0.30.1  0.002ms  0.001ms  0.001ms
  3   10.0.10.1  0.001ms  0.002ms  0.002ms

switch# traceroute 10.0.0.2 source 10.0.0.1
traceroute to 10.0.0.2 (10.0.0.2), 30 hops max
  1   10.0.0.2  0.299ms  0.155ms  0.115ms

switch# traceroute 10.0.0.2 source 1/1/1
traceroute to 10.0.0.2 (10.0.0.2), 30 hops max
  1   10.0.0.2  0.479ms  0.222ms  0.171ms
```

For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added `source IP address` and `source interface name` parameters. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## traceroute6

```
traceroute6 {<IPV6-ADDR> | <HOSTNAME>} [dstport <NUMBER> | maxttl <NUMBER> | probes
<NUMBER> | timeout <TIME>] [vrf <VRF-NAME>] source {<IPV6-ADDR> | <IFNAME>}
```

### Description

Uses traceroute for the specified IPv6 address or hostname with or without optional parameters.

| Parameter | Description |
|---|---|
| `IPv6-address <IPV6-ADDR>` | Specifies the IPv6 address. |
| `hostname` | Specifies the hostname of the device to traceroute. |
| `dstport <NUMBER>` | Specifies the destination port, *<1-34000>*. Default: 33434 |
| `maxttl <NUMBER>` | Specifies the maximum number of hops to reach the destination, *<1-255>*. Default: 30 |
| `probes <NUMBER>` | Specifies the number of probes, *<1-5>*. Default: 3 |
| `timeout <TIME>` | Specifies the traceroute timeout in seconds, *<1-60>*. Default: 3 seconds |
| `vrf <VRF-NAME>` | Specifies the virtual routing and forwarding (VRF) to use, *<VRF-NAME>*. |
| `source {<IPV6-ADDR> \| <IFNAME>}` | Specifies the source IPv6 address or interface name. |

## Usage

Traceroute is a computer network diagnostic tool for displaying the route (path), and measuring transit delays of packets across an Internet Protocol (IP) network. It sends a sequence of User Datagram Protocol (UDP) packets addressed to a destination host. The time-to-live (TTL) value, also known as hop limit, is used in determining the intermediate routers being traversed towards the destination.

## Examples

```
switch# traceroute6 0:0::0:1
traceroute to 0:0::0:1 (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.117 ms  0.032 ms  0.021 ms

switch# traceroute6 localhost
traceroute to localhost (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.089 ms  0.03 ms  0.014 ms

switch# traceroute6 0:0::0:1 maxttl 30
traceroute to 0:0::0:1 (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.117 ms  0.032 ms  0.021 ms

switch# traceroute6 0:0::0:1 dsrport 33434
traceroute to 0:0::0:1 (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.117 ms  0.032 ms  0.021 ms

switch# traceroute6 0:0::0:1 probes 2
traceroute to 0:0::0:1 (::1) from ::1, 30 hops max, 3 sec. timeout, 2 probes, 24
byte packets
 1  localhost (::1)  0.117 ms  0.032 ms

switch# traceroute6 0:0::0:1 timeout 3
traceroute to 0:0::0:1 (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.117 ms  0.032 ms  0.021 ms
```

```
switch# traceroute6 localhost vrf red
traceroute to localhost (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.077 ms  0.051 ms  0.054 ms

switch# traceroute6 localhost mgmt
traceroute to localhost (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.089 ms  0.03 ms  0.014 ms

switch# traceroute6 0:0::0:1 maxttl 30 timeout 3 probes 3 dstport 33434
traceroute to 0:0::0:1 (::1) from ::1, 30 hops max, 3 sec. timeout, 3 probes, 24
byte packets
 1  localhost (::1)  0.117 ms  0.032 ms  0.021 ms

switch# traceroute6 2001::2 source 2001::1
traceroute to 2001::2 (2001::2) from 2001::1, 30 hops max, 3 sec. timeout, 3
probes, 24 byte packets
1  2001::2 (2001::2)  0.4331 ms  0.3186 ms  0.1874 ms

switch# traceroute6 2001::2 source 1/1/1
traceroute to 2001::2 (2001::2) from 2001::1, 30 hops max, 3 sec. timeout, 3
probes, 24 byte  packets
1  2001::2 (2001::2)  0.6145 ms  0.4165 ms  0.1620 ms
```

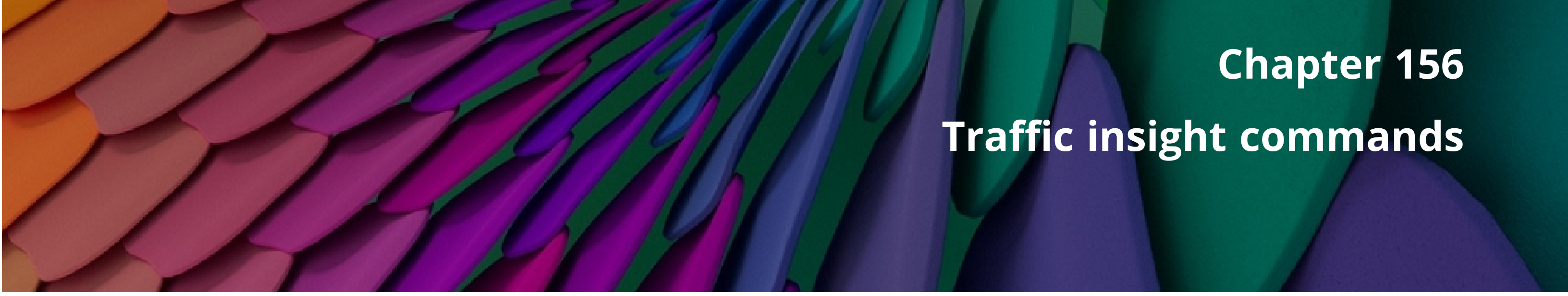
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Added **source IP address** and **source interface name** parameters. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |



# Chapter 156

# Traffic insight commands

## collect egress-vlan

```
collect egress-vlan
[no] collect egress-vlan
```

### Description

Configures collect (non-key) fields for a flow record when in the **config-flow-record** context.

The [no] form of this command removes a collect field from a flow record.

> Only one collect field can be specified per line.

> A flow record can have multiple collect fields.

| Parameter | Description |
|---|---|
| `https` | Specifies HTTP/HTTPS parameters as a non-key field in a flow record. |
| `dns` | Specifies DNS parameters as a non-key field in a flow record. |
| `name` | Specifies the name of the application. |
| `tls-attributes` | Specifies TLS Attributes as a non-key field in a flow record. |
| `egress-vlan` | Specifies egress VLAN ID as a non-key field in a flow record. |

### Examples

The following example adds **egress-vlan** collect field to flow-record-1 on the 6300 and 6400 switch series platforms:

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# collect egress-vlan
```

> For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | config<br>config-flow-record | Administrators or local user group members with execution rights for this command. |

## collect forwarding-status

```
collect forwarding-status
[no] collect forwarding-status
```

### Description

Configures collect (non-key) fields for a flow record when in the **config-flow-record** context.

The [no] form of this command removes a collect field from a flow record.

Only one collect field can be specified per line.

A flow record can have multiple collect fields.

| Parameter | Description |
|---|---|
| https | Specifies HTTP/HTTPS parameters as a non-key field in a flow record. |
| dns | Specifies DNS parameters as a non-key field in a flow record. |
| name | Specifies the name of the application. |
| tls-attributes | Specifies TLS Attributes as a non-key field in a flow record. |
| forwarding-status | Specifies forwarding status as a non-key field in a flow record. |

### Examples

The following example adds **forwarding-status** collect field to flow-record-1 on the 6300 and 6400 switch series platforms:

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# collect forwarding-status
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config`<br>`config-flow-record` | Administrators or local user group members with execution rights for this command. |

# diag-dump traffic-insight basic

`diag-dump traffic-insight basic`

### Description

Displays diagnostic information for Traffic Insight.

### Examples

```
switch# diag-dump traffic-insight basic
=========================================================================
[Start] Feature traffic-insight Time : Tue Jul 25 05:30:07 2023
=========================================================================
-------------------------------------------------------------------------
[Start] Daemon traffic-insightd
-------------------------------------------------------------------------
Printing App cache:
TI CPDI Clients MACs learnt: 0
Printing flows for instance test
Printing flows for instance test
Printing DNS cache received:
CLIENT_IP: 20.18.234.89        MAC: 00:50:56:96:0e:3f
DNS_SERVER_IP    LATENCY    TOTAL_SAMPLES    PORT     REQUEST_TIME     RESPONSE_
TIME
13.13.13.2         9450                7
12.12.12.2         8367                6

DNS on-boarding status:
On-boarded MACs:
38:bd:7a:c8:42:00
00:50:56:96:0e:3f

-------------------------------------------------------------------------
[End] Daemon traffic-insightd
-------------------------------------------------------------------------
=========================================================================
[End] Feature traffic-insight
=========================================================================
Diagnostic-dump captured for feature traffic-insight
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show capacities traffic-insight

```
show capacities traffic-insight
```

## Description

Displays the system capacities status and their values for Traffic Insight

## Examples

```
Switch# show capacities traffic-insight
System Capacities: Filter TRAFFIC_INSIGHT
Capacities Name                                                              Value
----------------------------------------------------------------------------------
-
Maximum number of Traffic-insight application flow cache entries             75000
Maximum number of Traffic-insight application flow table entries              2000
Maximum number of Traffic-insight instances                                      1
Maximum number of Traffic-insight monitors                                       5
Maximum number of Traffic-insight TopN monitor reports                         100
Maximum number of Traffic-insight TopN monitor reports per monitor              20
Maximum number of Traffic-insight raw flow cache entries                      8000
Maximum number of Traffic-insight raw flow table entries                      5000
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show debug buffer module trafficinsight

```
show debug buffer module trafficinsight
```

## Description

Displays Traffic Insight debug logs stored in the debug buffer.

## Examples

```
Switch# show debug buffer module trafficinsight
---------------------------------------------------------------------------------
show debug buffer
----------------------------------------------------------------------------------
2022-10-26:11:11:30.689510|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|Unsupported record id: 210
2022-10-26:11:11:30.689573|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|DMAC: 10:4f:58:88:08:00
2022-10-26:11:11:30.689639|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|Unsupported record id: 210
2022-10-26:11:11:30.689700|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|octetDeltaCount: 13751
2022-10-26:11:11:30.689761|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|packetDeltaCount: 36
2022-10-26:11:11:30.689823|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|source interface: 0
2022-10-26:11:11:30.689887|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|Unsupported record id: 252
2022-10-26:11:11:30.689949|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT_PACKET|App id: 3235
2022-10-26:11:11:30.690159|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT|ti_recv_messages_in_cpdi_layer:
Received message with size 200 from DL
2022-10-26:11:11:30.690184|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT|ti_cpdi_layer_handle_events: Handling
message in CPDI event 10
2022-10-26:11:11:30.690321|traffic-insightd|LOG_
DEBUG|AMM|1/1|TRAFFICINSIGHT|TRAFFICINSIGHT|ti_topn_add_record_to_monitor:New TOPN
hash node created for SIP 3501::100, DIP 3701::100, VRF default,dst_port 80
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show events traffic-insightd

```
show events -d traffic-insightd
```

### Description

Displays event logs generated by the switch modules since the last reboot for Traffic Insight.

### Examples

Showing event logs of Traffic Insight:

```
Switch# show events -d traffic-insightd
---------------------------------------------------
Event logs from current boot
---------------------------------------------------
2022-10-26T07:55:17.369208+00:00 6410 traffic-insightd[2518]: Event|14005|LOG_
INFO|UMM|-|Traffic Insight instance t1 enabled
2022-10-26T07:55:17.369309+00:00 6410 traffic-insightd[2518]: Event|14001|LOG_
INFO|UMM|-|Instance t1 created
2022-10-26T08:09:53.077469+00:00 EdgeInt traffic-insightd[2518]: Event|14003|LOG_
INFO|UMM|-|dns-avergae-latency running-statistics cleared for the monitor top3 and
instance t1
2022-10-26T08:24:52.998692+00:00 EdgeInt traffic-insightd[2518]: Event|14003|LOG_
INFO|UMM|-|dns-avergae-latency running-statistics cleared for the monitor top3 and
instance t1
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show running-config traffic-insight

```
show running-config traffic-insight
```

### Description

Display configuration settings for all traffic insight instances.

### Examples

```
switch# show running-config traffic-insight
traffic-insight t1
    enable
    source ipfix
    monitor mon1 type topN-flows group-by appid filter-by dstport 443
    monitor mon2 type application-flows
    monitor mon3 type raw-flows
    monitor mon4 type dns-average-latency
    monitor mon5 type topN-flows entries 20
...
```

```
 switch# show running-config traffic-insight
traffic-insight config_TI_3
enable
source ipfix
monitor mon2 type dns-average-latency
monitor mon3 type dns-onboarding-latency
...
```

For more information on features that use this command, refer to the Application Traffic Visibility Guide for your switch model.

## Related Commands

| Command | Description |
|---|---|
| traffic insight | Create and configure a traffic insight instance |

## Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# show tech traffic-insight

```
show tech traffic-insight
```

## Description

Shows the Traffic Insight configuration settings.

## Examples

The example shows the Traffic Insight configuration settings.

```
Switch# show tech traffic-insight
====================================================
Show Tech executed on Wed Oct 26 11:11:37 2022
====================================================
====================================================
[Begin] Feature traffic-insight
====================================================
*********************************
Command : show running-config traffic-insight
```

```
*********************************
traffic-insight t1
enable
source ipfix
!
monitor top4 type topN-flows entries 20 group-by srcip
monitor dns type dns-average-latency
monitor top3 type topN-flows entries 18 running-statistics-timeout 900 group-by
appid filter-by dstport 443
monitor app type application-flows
====================================================
[End] Feature traffic-insight
====================================================
====================================================
Show Tech commands executed successfully
====================================================
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show traffic-insight monitor-type

```
show traffic-insight <INSTANCE_NAME> monitor-type
                 application-flows <MONITOR_NAME> {app-details | client-role | url-
     details |
      permitted | denied | {tls-visibility [{client client-mac>}]| {tls-cert-visibility
     [detail|expired]}}

     dns-average-latency <MONITOR_NAME>
     topN-flows {<MONITOR_NAME> | all} [app-details]
     raw-flows <MONITOR_NAME>
```

## Description

Display information for traffic insight monitored flows.

| Parameter | Description |
|---|---|
| *<INSTANCE_NAME>* | Name of the traffic insight instance, string of maximum length up to 32 characters. |

| Parameter | Description |
|---|---|
| `monitor-type` | Specifies traffic insight monitor type. |
| `application flows` | Monitors client application flows and provides application level rx/tx counters and application visibility. The frequency at which the Traffic Insight application flow table is updated with new flow statistics is 30 seconds if the flow count is more than 2k. Otherwise, it is updated every 12 minutes. A maximum of 2k flows can be updated in the table at a time. Any excess flows are updated in subsequent update. |
| `raw-flows` | Shows the last 5k flows that switch has received across all the ports where IPFIX is enabled in non-chronological order. |
| `<MONITOR_NAME> \| all` | Specify a monitor name to display information for that monitor, or enter all to display information for all monitors.<br>**NOTE:** The **all** parameter displays all topN-flows monitor instances information |
| `app-details` | Displays traffic insight monitor flows with application details.<br>This option is supported only on monitors with one of the following configurations:<br>`monitor <MONITOR_NAME> monitor-type topN-flows {filter-by <FILTER-TYPE>}`<br>`monitor <MONITOR_NAME> monitor-type topN-flows group-by appid {filter-by <FILTER-TYPE>}`<br>`monitor <MONITOR_NAME> monitor-type topN-flows group-by srcip_appid {filter-by <FILTER-TYPE>}` |
| `client-role` | Shows traffic insight monitor flows with client role details. |
| `url-details` | Shows traffic insight flows with app URL details. |
| `permitted` | Shows traffic insight flows permitted by ABP |
| `denied` | Shows traffic insight flows denied by ABP |
| `tls-visibility` | Shows TLS attributes for traffic insight flows. |
| `client <CLIENT_MAC>` | (Optional) Specifies the client MAC address in xx:xx:xx:xx:xx:xx format. |
| `tls-cert-visibility` | Shows TLS certificate attributes for traffic insight flows. |
| `detail` | (Optional) Shows traffic insight flows with application TLS Certificate Visibility with additional details |
| `expired` | (Optional) Shows traffic insight flows with application TLS for expired . |

To have application flows indicate denied flows appropriately, IPFIX monitor should contain forwarding status and egress VLAN collect configurations.

In the 6300 and 6400 Switch Series **policy_action** will be set to permitted for all flows when **collect forwarding-status** is not enabled.

## Examples

The following example shows **all** monitoring flow data for **topN-flows**, for instance **instance-1**:

```
switch# show traffic-insight instance-1 monitor-type topN-flows all

Name      : top-5-dst-ip
Entries   : 5
group By  : dst_ip
Filter By : None
Running Statistics Timeout: 2700


Dataset   : Running Statistics

Rank        dst_ip                Bytes
-------------------------------------------
1           34.94.235.109         4168
2           61.113.171.176        3500
3           41.244.240.249        3120
4           40.159.33.244         3084
5           247.182.130.159       3084


Name : top-5-conversations
Entries : 5
group By : dst_ip
Filter By : None
Running Statistics Timeout: 2700

Dataset: Running Statistics

Rank    src_ip       dst_ip          ip_proto src_port dst_port   Bytes
---------------------------------------------------------------------------
1       192.168.1.6  223.126.110.198  17      18251    38530      102
2       11.89.15.20  143.193.61.233   17      43482    5929       103
3       107.56.36.77 255.111.58.122    6      15820    59117      104
4       1000::1      2000::2           6      20065    53239      105
5       3000::3      5000::5          17      12124    50782      105
```

The following example shows **top-5-dst-ip** monitoring flow data for **topN-flows**, for instance **instance-1**:

```
switch# show traffic-insight instance-1 monitor-type topN-flows top-5-dst-ip

Name       : top-5-dst-ip
Entries    : 5
group By   : dst_ip
Filter By  : None
Running Statistics Timeout: 2700

Dataset: Running Statistics

Rank    dst_ip                                             Bytes
---------------------------------------------------------------------------
1       34.94.235.109                                      4168
2       61.113.171.176                                     3500
3       41.244.240.249                                     3120
4       40.159.33.244                                      3084
5       247.182.130.159                                    3084
```

The following example shows **all app-details** monitoring flow data for **topN-flows**, for instance **instance-1**:

```
switch# show traffic-insight instance-1 monitor-type topN-flows all app-details
Name       : top-5-conversations
Entries    : 5
group By   : none
Filter By  : None
Running Statistics Timeout: 2700

Dataset: Running Statistics


Rank    src_ip       dst_ip          app_id   app_name   app_category      Bytes
--------------------------------------------------------------------------------
1       192.168.1.6  223.126.110.198  54      google     Web               1052
2       11.89.15.20  143.193.61.233   29      dhcp       Networkservice    1043
3       107.56.36.77 255.111.58.122   32      dns        Networkservice    1034
4       1000::1      2000::2          244     facebook   Social-networking 1025
5       3000::3      5000::5          240     youtube    Streaming         1005

Name       : monitor2
Group By   : ipproto
Entries    : 5
Filter By  : None
Running Statistics Timeout   : 2700

Application details cannot be displayed for flows grouped by ipproto.

Name       : monitor3
Group By   : srcport
Entries    : 5
Filter By  : None
Running Statistics Timeout   : 2700

Application details cannot be displayed for flows grouped by srcport.
```

The following example shows **dns-average-latency** data for **mntr2** monitoring, for instance **instance-1**:

```
switch# show traffic-insight instance-1 monitor-type dns-average-latency mntr2
Name                                   : mntr2
Type                                   : dns-average-latency
Start time for latency calculation     : 10/10/2022 04:47:26.869937 UTC
End time for latency calculation       : 10/10/2022 04:48:26.812820 UTC
client_mac          client_ip      dns_server_ip       dns_avergae_latency(msec)
-------------------------------------------------------------------------------
aa:aa:aa:aa:aa:aa   192.168.11.1   172.0.0.1           200
bb:bb:bb:bb:bb:bb   192.168.12.1   172.1.1.1           300
cc:cc:cc:cc:cc:cc   192.168.13.1   172.2.2.2           150
```

The following example shows **all** monitoring flow data permitted or denied for **application-flows**, for instance **instance-1**:

```
switch# sho traffic-insight t1 monitor-type application-flows mon2 app-details
Name            : mon2
Type            : application-flows
---------------------------------------------
client_mac      : 00:15:5d:11:6e:04
app_id          : 3618
app_name        : google-api
app_category    : web
app_description : Google APIs
```

```
Rx(Bytes)        : 0
Tx(Bytes)        : 22678
--------------------------------------------
client_mac       : 00:15:5d:11:6e:04
app_id           : 1122
app_name         : google-play
app_category     : mobile-app-store
app_description  : Google Play Store
Rx(Bytes)        : 0
Tx(Bytes)        : 186
---------------------------------------------
client_mac       : 00:15:5d:11:6e:04
app_id           : 968
app_name         : amazon
app_category     : web
app_description  : Amazon Generic Services
Rx(Bytes)        : 0
Tx(Bytes)        : 2335
----------------------------------------------
client_mac       : 00:15:5d:11:6e:04
app_id           : 205
app_name         : tcp
app_category     : network-service
app_description  : Transmission Control Protocol
Rx(Bytes)        : 0

switch # sho traffic-insight t1 monitor-type application-flows mon2 permitted
Name             : mon2
Type             : application-flows
-----------------------------------------------
src_ip           : 10.10.31.147
dst_ip           : 142.250.113.95
role             : vm_traffic
app_name         : google-api
Rx(Bytes)        : 0
Tx(Bytes)        : 22678
-----------------------------------------------
src_ip           : 10.10.31.147
dst_ip           : 142.250.138.100
role             : vm_traffic
app_name         : google-play
Rx(Bytes)        : 0
Tx(Bytes)        : 186
-----------------------------------------------
src_ip           : 10.10.31.147
dst_ip           : 18.141.38.150
role             : vm_traffic
app_name         : amazon
Rx(Bytes)        : 0
Tx(Bytes)        : 2335


switch# sho traffic-insight t1 monitor-type application-flows mon2 denied
Name             : mon2
Type             : application-flows
------------------------------------------------
src_ip           : 10.10.31.147
dst_ip           : 13.249.21.67
role             : vm_traffic
app_name         : amazon
Tx(Bytes)        : 3968
-------------------------------------------------
```

```
src_ip          : 10.10.31.147
dst_ip          : 35.71.139.29
role            : vm_traffic
app_name        : whatsapp
Tx(Bytes)       : 12318
```

The following example shows **client-role** details for **application-flows**, for instance **instance-1**:

```
switch# show traffic-insight instance-1 monitor-type application-flows mntr1
client-role
Name            : mon1
Type            : application-flows
--------------------------------------------------------------------------------
---------
client_mac      : aa:aa:aa:aa:aa:aa
role            : test_role1
app_name        : google
Rx(Bytes)       : 0
Tx(Bytes)       : 448
--------------------------------------------------------------------------------
---------
client_mac      : bb:bb:bb:bb:bb:bb
role            : test_role2
app_name        : dhcp
Rx(Bytes)       : 300
Tx(Bytes)       : 500
--------------------------------------------------------------------------------
---------
client_mac      : cc:cc:cc:cc:cc:cc
role            : test_role1
app_name        : youtube
Rx(Bytes)       : 40000
Tx(Bytes)       : 3000
```

The following example shows **url-details** details for **application-flows**, for instance **instance-1**:

```
switch# show traffic-insight instance-1 monitor-type application-flows mon1 url-
details
Name            : mon1
Type            : application-flows
--------------------------------------------------------------------------------
-------------------------------------
client_mac      : 00:15:5d:10:da:02
app_id          : 1111
app_name        : windows-marketplace
app_url         : https://apps.microsoft.com/store/app
Rx(Bytes)       : 1822
Tx(Bytes)       : 448
--------------------------------------------------------------------------------
-------------------------------------
client_mac      : 00:15:5d:10:da:0a
app_id          : 1284
app_name        : akamai
app_url         : https://www.akamai.com/
Rx(Bytes)       : 1533
Tx(Bytes)       : 945
--------------------------------------------------------------------------------
-------------------------------------
```

```
client_mac      : 00:15:5d:10:da:02
app_id          : 54
app_name        : google
app_url         : https://www.google.com/
Rx(Bytes)       : 27182
Tx(Bytes)       : 3489
```

The following example shows **On-demand flows** details for **raw-flows**, for instance **instance-1**:

```
switch# show traffic-insight instance-1 monitor-type raw-flows mntr1
Name       : mon1
Type       : raw-flows
-------------------------------------------------------------------------------
src_ip     : 192.168.11.6                dst_ip   : 223.126.100.198
src_port   : 10000                       dst_port : 9000
protocol   : UDP
app_name   : windows-marketplace         action   : permitted
rx(packets): 1                           rx(bytes): 128
-------------------------------------------------------------------------------
src_ip     : 192.168.12.6                dst_ip   : 223.126.111.198
src_port   : 11000                       dst_port : 5000
protocol   : TCP
app_name   : google                      action   : permitted
rx(packets): 10                          rx(bytes): 5120
-------------------------------------------------------------------------------
src_ip     : 192.168.13.6                dst_ip   : 223.126.111.198
src_port   : 12000                       dst_port : 8000
protocol   : TCP
app_name   : akamai                      action   : denied
rx(packets): 1                           rx(bytes): 512
-------------------------------------------------------------------------------
```

The following examples show TLS attributes for traffic insight flows.

~~~
switch# show traffic-insight instance-1 monitor-type application-flows mon1 tls-
visibility
Name       : mon1
Type       : application-flows
client_mac          src_ip              dest_ip             app_name
  tls_version         next_protocol       bytes(Rx+Tx)
----------------------------------------------------------------------------------
--
00:50:56:96:69:ed   10.101.88.28        10.78.90.46         amazon
  TLSv1.2             HTTP/2              3816
00:50:56:96:69:ed   10.101.88.28        10.79.90.46         https
  TLSv1.2             HTTP/1.1            2579195
00:50:56:96:69:ed   10.101.88.28        10.79.90.46         exelate
  TLSv1.2             HTTP/2              6411
00:50:56:96:28:b1   10.100.129.213      16.93.50.254        dns
  -                   -                   53573
00:50:56:96:28:b1   10.100.129.213      10.79.90.46         amazon-aws
  TLSv1.2             HTTP/2              91055
...
----------------------------------------------------------------------------------
--
Total Traffic      : 19902324(bytes)
Encrypted Traffic  : 19758443(bytes)
Percentage of Encrypted Traffic : 99.277064
```
~~~

```
switch# show traffic-insight instance-1 monitor-type application-flows mon1 tls-
visibility client 00:50:56:96:28:b1
Name       : mon1
Type       : application-flows
Client_mac : 00:50:56:96:69:ed
src_ip              dest_ip             app_name                 tls_version
  next_protocol       bytes(Rx+Tx)
----------------------------------------------------------------------------------
--
10.101.88.28        10.79.90.46         adobe                    TLSv1.2
  HTTP/2              380
10.101.88.28        10.79.90.46         oracle                   TLSv1.2
  HTTP/2              585
10.101.88.28        10.79.90.46         amazon-adsystem          TLSv1.2
  HTTP/2              1128
10.101.88.28        10.78.90.46         amazon                   TLSv1.2
  HTTP/2              7763
10.101.88.28        10.79.90.46         exelate                  TLSv1.2
  HTTP/2              668
...
----------------------------------------------------------------------------------
--
Total Traffic      : 27218(bytes)
Encrypted Traffic  : 27218(bytes)
Percentage of Encrypted Traffic : 100.000000
```

The following examples show TLS certificate attributes for traffic insight flows.

~~~
6300# show traffic-insight instance-1 monitor-type application-flows mon1 tls-
cert-visibility
Name       : mon1
Type       : application-flows
client_mac          src_ip              dest_ip             app_name
cert_issuer              cert_issued_date      cert_expiry_date
(DD/MM/YY HH:MM:SS)   (DD/MM/YY HH:MM:SS)
----------------------------------------------------------------------------------
--
00:50:56:96:69:ed   10.101.88.28        10.79.90.46         oracle
DigiCert TLS RSA SHA256  07/02/23  00:00:00    08/02/24  23:59:59
00:50:56:96:69:ed   10.101.88.28        10.78.90.46         amazon
Amazon RSA 2048 M01      27/01/23  00:00:00    27/01/24  23:59:59
00:50:56:96:69:ed   10.101.88.28        10.79.90.46         exelate
DigiCert TLS RSA SHA256  08/06/22  00:00:00    10/06/23  23:59:59
```
```
6300# show traffic-insight instance-1 monitor-type application-flows mon1 tls-
cert-visibility detail
Name       : mon1
Type       : application-flows
client_mac          src_ip              dest_ip             app_name
cert_issuer              cert_issued_date      cert_expiry_date
(DD/MM/YY HH:MM:SS)   (DD/MM/YY HH:MM:SS)
JA3                                     JA3S
----------------------------------------------------------------------------------
---------
00:50:56:96:69:ed   10.101.88.28        10.79.90.46         oracle
DigiCert TLS RSA SHA256  07/02/23  00:00:00    08/02/24  23:59:59
28a2c9bd18a11de089ef85a160da29e4        42ec7b1db61428bf1cc6e01b9ef02b04
00:50:56:96:69:ed   10.101.88.28        10.78.90.46         amazon
Amazon RSA 2048 M01      27/01/23  00:00:00    27/01/24  23:59:59
28a2c9bd18a11de089ef85a160da29e4        8bbcb0bf0a942234f77bd504ffdd2013
~~~

~~~
00:50:56:96:69:ed   10.101.88.28        10.79.90.46         exelate
DigiCert TLS RSA SHA256   08/06/22  00:00:00    10/06/23  23:59:59
28a2c9bd18a11de089ef85a160da29e4        c4b2785a87896e19d37eee932070cb22
```
```
6300# show traffic-insight instance-1 monitor-type application-flows monitor1 tls-
cert-visibility expired
Name        : mon1
Type        : application-flows
client_mac          src_ip              dest_ip             app_name
cert_issuer              cert_issued_date      cert_expiry_date
(DD/MM/YY HH:MM:SS)   (DD/MM/YY HH:MM:SS)
---------------------------------------------------------------------------------
---------
00:50:56:96:69:ed   10.101.88.28        10.79.90.46         exelate
DigiCert TLS RSA SHA256   08/06/22  00:00:00    10/06/23  23:59:59
28a2c9bd18a11de089ef85a160da29e4        c4b2785a87896e19d37eee932070cb22
~~~

Policy-action for the flows is only based on Port-Access Role and Application Based Policing configurations.

For more information on features that use this command, refer to the Security Guide for your switch model.

### Related Commands

| Command | Description |
|---|---|
| traffic insight | Create and configure a traffic insight instance. |

### Command History

| Release | Modification |
|---|---|
| 10.13 | The sub-parameters **tls-cert-visibility**, **tls-cert-visibility permitted**, **denied**, **client-role**, and **url-details** were introduced. |
| 10.12.1000 | The **dns-onboarding-latency** sub-parameter was introduced. |
| 10.11 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 (v2 profile only) | Manager (#) | Administrators or local user group members with execution rights for this command. |

## traffic insight

```
traffic-insight <INSTANCE_NAME>
   [no] enable
   [no] source ipfix
   [no] monitor <NAME> type
```

```
    topN-flows
       [
       entries <Entry-VALUE> |
       running-statistics-timeout <TIMEOUT-SECONDS> |
       group-by {<GROUP-TYPE>} |
       filter-by {<FILTER-TYPE>}
       ]
    application-flows
    raw-flows
    dns-average-latency
    dns-onboarding-latency
```

## Description

Traffic insight monitors data collected from flow exporters like the IP Flow Information Export (IPFIX) flow exporter. Traffic insight tracks multiple monitor requests simultaneously and provides monitor reports for each request.

| Parameter | Description |
|---|---|
| `<INSTANCE_NAME>` | Name of the traffic insight instance, string of maximum length up to 32 characters. |
| `[no] enable` | Enable or disable this traffic insight configuration |
| `[no] source ipfix` | The traffic insight configuration uses this source protocol to collect traffic flows. The only available protocol is **ipfix**. |
| `monitor <INSTANCE_NAME>` | Enable flow monitoring on a traffic insight instance and configure rules for filtering and grouping traffic flows. |
| `type` | Specifies type of the monitor |
| `topN-flows` | Monitors IP traffic flowing through the switch and captures topN flows volume. The default number of top flows captured is 5. |
| `entries <Entry-VALUE>` | Select the maximum number of entries in the monitor report. Range: 1 to 20. The default value is 5. |
| `running-statistics-timeout <TIMEOUT-SECONDS>` | Sets running-statistics reset timeout value. Range: 360 to 86400. The default value is 600. |
| `filter-by <FILTER-TYPE>` | Include any of the following values to filter the data set.<br>■ **src_ip_mask *<IP_MASK>***—Filter by source IP netmask<br>■ **dst_ip_mask *<IP_MASK>***—Filter by destination IP netmask<br>■ **src_ip *<IP_ADDRESS>***—Filter by source IP address |

| Parameter | Description |
|---|---|
|  | ■ **dst_ip <*IP_ADDRESS*>**— Filter by destination IP address<br>■ **src_port <*PORT*>**—Filter by source port number<br>■ **dst_port <*PORT*>**:—Filter by destination port number<br>■ **ip_proto <*PROTOCOL*>**—Filter by IP protocol |
| `group-by <GROUP-TYPE>` | Include any of the following values to create a monitor that groups matching traffic flows by that criteria.<br>■ **srcip**—Group by source IP address<br>■ **dstip** —Group by destination IP address<br>■ **srcport**—Group by source port number<br>■ **dstport**—Group by destination port number<br>■ **ipproto**—Group by IP protocol<br>■ **appid**—Group by application ID<br>■ **srcip_dstip**—Group by Source IP and Destination IP<br>■ **srcip_dstport**—Group by Source IP and Destination Port<br>■ **srcip_appid**—Group by Source IP and Application ID. |
| `application-flows` | Monitors client application flows and provides application level rx/tx counters and application visibility. The frequency at which the Traffic Insight application flow table is updated with new flow statistics is 30 seconds if the flow count is more than 2k. Otherwise, it is updated every 12 minutes. A maximum of 2k flows can be updated in the table at a time. Any excess flows are updated in subsequent updates. |
| `raw-flows` | Provides uni-direction flow details for all apps or clients to CNX on-demand basis. It is used by CNX for trouble-shooting work-flow. |
| `src_ip` | Source IP address of the flow. |
| `dst_ip` | Destination IP address of the flow. |
| `protocol` | Type of protocol that is carried by IP. |

| Parameter | Description |
|---|---|
| `dest port` | Destination L4 port of the IP traffic. |
| `app_details` | Application details like app_name, category, URL etc. |
| `Bytes` | Number of bytes received. |
| `Packets` | Number of packets received. |
| `Action` | Specifies if flow is allowed or blocked due to a policy. |
| `dns-average-latency` | Monitors DNS request and response flows and provides average dns-latency details per client. The Traffic Insight application flow table in the database is updated every 5 minutes with dns average latency information. |
| `dns-onboarding-latency` | Monitors DNS request and response flows and provides DNS onboarding latency details per client. |
| `no` | Negate a command or set its defaults |

## Examples

The following example creates a traffic insight instance named **TI_1**:

```
switch(config)# traffic-insight  TI_1
```

The following example deletes a traffic insight instance named **TI_1**:

```
switch(config)# no traffic-insight TI_1
```

The following example enables traffic insight instance for **TI_1** instance:

```
switch(config)# traffic-insight  TI_1
switch(config-ti)#enable
```

The following example disables traffic insight instance for **TI_1** instance:

```
switch(config)# traffic-insight  TI_1
switch(config-ti)#no enable
```

The following example sets the source protocol for **TI_1** instance to collect flows information from IPFIX:

```
switch(config)# traffic-insight TI_1
switch(config-ti)# source ipfix
```

The following example removed the source protocol for **TI_1** instance:

```
switch(config)# traffic-insight TI_1
switch(config-ti)# no source ipfix
```

The following examples create traffic insight monitor with filter and grouping rules for **topN-flows** for the **mnti1** monitoring:

```
switch(config)# traffic-insight TI_1
switch(config-ti)# monitor mnti1 type topN-flows
switch(config-ti)# monitor mnti1 type topN-flows running-statistics-timeout 1800
switch(config-ti)# monitor type topN-flows group-by src_ip
switch(config-ti)# monitor type topN-flows filter-by src_ip_mask 192.0.0.0/8
```

The following example creates a traffic insight monitor with filter and grouping rules for **topN-flows** using the below parameter for the **mnti1** monitoring:

- 10 entries
- Grouped by **srcip** (Source IP)
- Filter by **src_ip_mask** (Source IP Mask)

```
switch(config-ti)# monitor mnti1 type topN-flows entries 10 group-by srcip filter-
by src_ip_mask 192.0.0.0/8
```

The following example removes flow monitoring:

```
switch(config)#traffic-insight TI_1
switch(config-ti)# no monitor mnti1 topN-flows
```

The following examples create a traffic insight monitor for **application-flows** for the **mnti2** instance:

```
switch(config-ti)# monitor mnti2 type application-flows
```

The following examples create a traffic insight monitor for **raw-flows** for the **mnti3** instance:

```
switch(config-ti)# monitor mnti3 type raw-flows
```

The following examples create a traffic insight monitor for **dns-average-latency** for the **mnti3** instance:

```
switch(config-ti)# monitor mnti3 type dns-average-latency
```

The following examples create a traffic insight monitor for **dns-onboarding-latency** for the **mnti3** instance:

```
switch(config-ti)# monitor mnti3 type dns-onboarding-latency
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.12.1000 | The **dns-onboarding-latency** sub-parameter was introduced. |
| 10.13 | The **raw-flows** sub-parameter introduced. |
| 10.11 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# Chapter 157

# Two-factor authentication commands

## aaa authorization radius

```
aaa authorization radius {ssh | https-server} group <GROUP-LIST>
no aaa authorization radius {ssh | https-server} group <GROUP-LIST>
```

### Description

Enables RADIUS authorize-only for use with two-factor authentication. By default RADIUS authenticates and authorizes a client that is configured for AAA based access. This command causes the RADIUS server to instead be used only for authorization and not for authentication.

Authorization requests are sent over TLS and therefore RADIUS authorize-only requires a RadSec RADIUS server.

> If command authorization is also configured it is given priority over RADIUS authorize-only and therefore command authorization is done on the basis of command authorization configuration and not the user role and privilege level assigned by the RADIUS server.

The **no** form of this command disables RADIUS authorize-only, causing RADIUS to be again used for both authentication and authorization.

| Parameter | Description |
|---|---|
| `ssh` | Selects the SSH authorization list. |
| `https-server` | Selects the HTTPS server authorization list. |
| `group <GROUP-LIST>` | Specifies the list of remote RADIUS server group names. Each name can be specified one time. Predefined remote RADIUS group name **radius** is available.<br>The remote RADIUS server groups are accessed in the order that the group names are listed in this command. Within each group, the servers are accessed in the order in which the servers were added to the group. Server groups are defined using command **aaa group server** and servers are added to a server group with the command **server**. |

### Examples

Enabling RADIUS authorize only for SSH with the default RADIUS group:

```
switch(config)# aaa authorization radius ssh group radius
All commands will fail if none of the radsec servers in the group list are
reachable.
Continue (y/n)? y
```

Disabling RADIUS authorize only for SSH with the default RADIUS group, causing RADIUS to be again used for both authentication and authorization:

```
switch(config)# no aaa authorization radius ssh group radius
```

Enabling RADIUS authorize only for HTTPS server with the default RADIUS group:

```
switch(config)# aaa authorization radius https-server group radius
All commands will fail if none of the radsec servers in the group list are
reachable.
Continue (y/n)? y
```

Disabling RADIUS authorize only for HTTPS server with the default RADIUS group, causing RADIUS to be again used for both authentication and authorization:

```
switch(config)# no aaa authorization radius https-server group radius
```

For more information on features that use this command, refer to the Security Guide for your switch model.

| Release | Modification |
|---|---|
| 10.11 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## https-server authentication certificate

`https-server authentication certificate [authorization radius] [username {<CERT-FIELD>}]`

### Description

Enables certificate-based authentication where the HTTPS server uses an X.509 certificate for authentication and a RADIUS server for authorization.

Enabling password authentication is the only way of disabling certificate authentication.

| Parameter | Description |
|---|---|
| `authorization radius` | Specifies that after certificate authentication succeeds, instead of prompting for a password, the HTTPS server checks the RADIUS server only for authorization. A local user is not required.<br>By default, the username found in the certificate field UserPrincipalName (UPN) is used for authorization on the RADIUS serer.<br>When this parameter is omitted, **authorization radius** is still the assumed active setting. |
| *<CERT-FIELD>* | Selects which certificate username field is to be used for authorization. |

| Parameter | Description |
|---|---|
| | ▪ Specify **user_pincipal_name** to use the certificate UserPrincipalName (UPN) field. This is the default.<br>▪ Specify **common_name** to use the certificate CommonName (CN) field.<br>When this parameter is omitted, **user_pincipal_name** is assumed. |

### Examples

Enabling HTTPS server authentication with authorization on a RADIUS server with the username in certificate field UserPrincipalName (UPN):

```
switch(config)# https-server authentication certificate authorization radius
```

Enabling HTTPS server authentication with authorization on a RADIUS server with the username in certificate field UserPrincipalName (UPN) (**authorization radius** is still implied even though not specified):

```
switch(config)# https-server authentication certificate
```

Enabling HTTPS server authentication with authorization on a RADIUS server with the username in certificate field CommonName (CN):

```
switch(config)# https-server authentication certificate authorization radius
username common_name
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ssh certificate-as-authorized-key

```
ssh certificate-as-authorized-key
no ssh certificate-as-authorized-key
```

### Description

Enables SSH enforcement that the username must be present in the certificate that is being used for authorization. This configuration alters how certificate-based authentication maps to a user account. When this is enabled, SSH will not require local user association with an authorized-key and instead enforces that the username used to log in is present within the certificate.

The SSH server will check for the username in certificate fields **Common Name** or **User Principle Name** for a match. If a certificate is not used for authentication then this configuration has no effect on SSH authentication.

The **no** form of this command disables the SSH enforcement of username in the certificate.

### Examples

Enabling SSH enforcement of username in the certificate:

```
switch(config)# ssh certificate-as-authorized-key
```

Disabling SSH enforcement of username in the certificate:

```
switch(config)# no ssh certificate-as-authorized-key
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |

## ssh two-factor-authentication

```
ssh two-factor-authentication [authorization radius]
no ssh two-factor-authentication [authorization radius]
```

### Description

Enables the selected SSH Two Factor authentication method. Two-factor authentication uses an X.509 certificate and possibly a password. First the X.509 certificate presented by the user is authenticated.

Then, if successful, (when the **authorization-radius** parameter is not specified) the (locally-defined) user is prompted for a password. When the **authorization radius** parameter is specified, instead of prompting for a password, SSH checks only for authorization with the remote RADIUS server. A local user is not required.

The **no** form of the command disables SSH two-factor authentication.

| Parameter | Description |
|---|---|
| `authorization radius` | Specifies that after certificate authentication succeeds, SSH checks the RADIUS server only for authorization. |

## Examples

Enabling two-factor authentication for local user with password prompting:

```
switch(config)# ssh two-factor-authentication
```

Disabling two-factor authentication for local user with password prompting:

```
switch(config)# no ssh two-factor-authentication
```

Enabling two-factor authentication for remote-only RADIUS-defined users without password prompting:

```
switch(config)# ssh two-factor-authentication authorization radius
```

Disabling two-factor authentication for remote-only RADIUS-defined users without password prompting: :

```
switch(config)# no ssh two-factor-authentication authorization radius
```

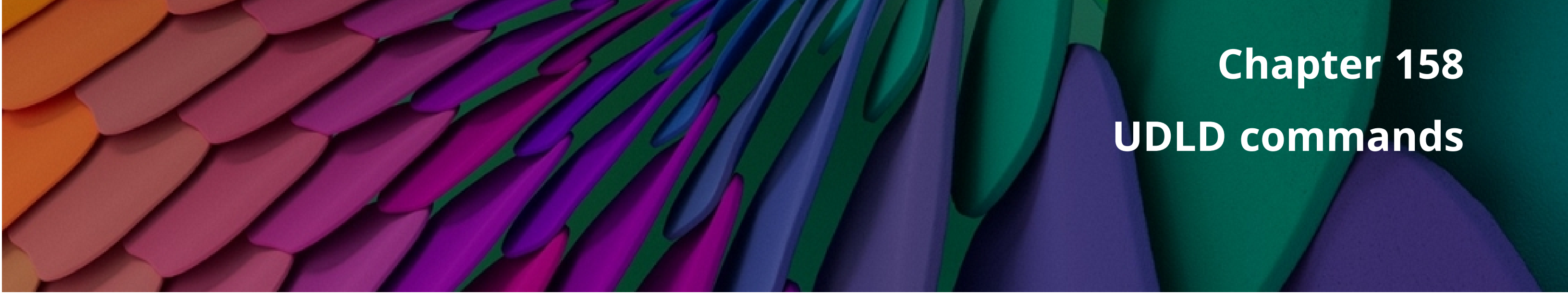
For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11 | Added the **authorization radius** parameter |
| 10.10 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |



# Chapter 158

# UDLD commands

## clear udld statistics

```
clear udld statistics [interface <INTERFACE-NAME>]
```

### Description

Clears UDLD statistics for all interfaces or a specific interface.

### Examples

*On the 6400 Switch Series, interface identification differs.*

Clearing all UDLD statistics on all interfaces:

```
switch# clear udld statistics
```

Clearing all UDLD statistics on interface 1/1/1:

```
switch# clear udld statistics interface 1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show udld

```
show udld [interface <INTERFACE-NAME>] [vsx-peer]
```

### Description

Displays UDLD information for all interfaces or for a specific interface.

| Parameter | Description |
|---|---|
| `interface <INTERFACE-NAME>` | Specifies the name of a logical interface on the switch, which can be:<br>▪ An Ethernet interface associated with a physical port. Use the format **member/slot/port** (for example, **1/3/1**).<br>▪ UDLD runs only on physical interfaces. LAGs, tunnels, and the like are not supported. However, UDLD can be configured individually on each port of a LAG or trunk group. Configuring UDLD on a trunk group primary port enables UDLD on that port only. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Displaying all UDLD information:

```
switch# show udld

Abbreviations:
 VTF - Verify-then-forward    FTV - Forward-then-verify
 NOR - RFC 5171 normal        AGG - RFC 5171 aggresive

----------------------------------------------------------------------
Interface  UDLD      UDLD      UDLD           UDLD    Mode  Interval
           Config    State     Substate       Link
----------------------------------------------------------------------
1/1/1      Disabled  Inactive  Undetermined   Unblock FTV   8000
1/1/2      Enabled   Active    Bidirectional  Unblock FTV   7000
1/1/3      Enabled   Active    Blocked        Block   FTV   7000
1/1/4      Enabled   Inactive  Uninitialized  Unblock NOR   7000
1/1/5      Enabled   Active    ErrDisabled    Block   AGG   7000
1/1/6      Disabled  Active    Detection      Unblock NOR   7000

---------------------------------------------------------------
Retries  Tx       Rx       Rx          Rx          Transitions
         Pkts     Pkts     Pkts disc.  Pkts drop.
---------------------------------------------------------------
4        4        54       123         123         1
7        1234567  1548421  23214       1878981     3
4        3        77871    2157        81878       1
5        50       0        0           0           0
3        150      25       0           2           1
3        6        54       123         23          1
```

Displaying information for interface **1/1/1**:

```
switch# show udld interface 1/1/1

Interface 1/1/1
 Config: Enabled
 State: Active
 Substate: Bidirectional
 Link: Unblock
 Version: Aruba OS
 Mode: Forward then verify
 Interval: 7000 milliseconds
 Retries: 7
 Tx: 1234567 packets
 Rx: 1548421 packets, 23214 discarded packets, 1878981 dropped packets
 Port transitions: 3
```

Displaying the UDLD enable interfaces information:

```
switch# show udld enabled

Abbreviations:
 VTF - Verify-then-forward    FTV - Forward-then-verify
 NOR - RFC 5171 normal        AGG - RFC 5171 aggresive

----------------------------------------------------------------------------------
---------------------------------------------------
Interface  UDLD      UDLD      UDLD           UDLD     Mode  Interval  Retries  Tx
      Rx       Rx          Rx          Transitions
           Config    State     Substate       Link
Pkts     Pkts     Pkts disc.  Pkts drop.
----------------------------------------------------------------------------------
---------------------------------------------------
2          Enabled   Active    Bidirectional  Unblock  FTV   7000      7
1234567  1548421  23214       1878981     3
3          Enabled   Active    Blocked        Block    FTV   7000      4        3
      77871    2157        81878       1
4          Enabled   Inactive  Uninitialized  Unblock  NOR   7000      5        50
      0       0           0           0
5          Enabled   Active    ErrDisabled    Block    AGG   7000      3
150      25       0           2           1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# udld

```
udld [disable]
no udld [disable]
```

### Description

Enables UDLD support on a physical interface. UDLD is disabled by default. UDLD is configured on a per-port basis and must be enabled at both ends of the link.

UDLD runs only on physical interfaces. LAGs, tunnels, and the like are not supported. However, UDLD can be configured individually on each port of a LAG or trunk group. Configuring UDLD on a trunk group's primary port enables UDLD on that port only.

The **no** form of this command disables UDLD support and resets all configuration values to their default settings.

| Parameter | Description |
|---|---|
| *disable* | Disables UDLD on the interface but retains all UDLD configuration settings. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling UDLD on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# udld
```

Disabling UDLD on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no udld
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## udld interval

```
udld interval <TIME>
```

```
no udld interval [<TIME>]
```

## Description

Sets the packet transmission interval.

The **no** form of this command sets the packet transmission interval to the default value of 7000 ms.

The allowed values vary depending on the operation mode.

The default interval is 7000 ms (7 seconds) for both ArubaOS-Switch and RFC5171 operation modes.

Values must be specified as multiples of 10 ms (7000 ms is allowed but 7005 ms is not a valid setting).

Sessions under 100ms total detection time are susceptible to increasing processing load on the system. It is advisable to experiment with values that provide adequate detection times and system/protocol stability. Aruba recommends additional testing prior to configuring these sessions on a production environment.

However, these settings are recommended for specific deployments only, such as using UDLD for Ethernet Ring Protection Switching (ERPS) link-failure detection. The minimum detection time appropriate for your environment depends on the specific device family and configuration on which the protocol and system load is running. Aruba recommends additional testing for these configurations. During testing, monitor for unexpected false positive detections (i.e., UDLD records a failure when there was not any) on the interfaces running UDLD. Such false positive failures are an indication that the interval configuration requires tuning and that the system load might not allow such configuration.

When configuring detection times under 100ms for LAG interfaces, consider adding the interface first to the LAG and then enabling UDLD in the interface, to avoid false positive link failure detections. Adding an interface to a LAG causes momentary control plane traffic interruption for up to 100ms, which UDLD detects as a link failure if the detection time is following the control traffic interruption interval.

| Parameter | Description |
|---|---|
| *<TIME>* | Specifies the packet transmission interval. Range: 200 ms to 90000 ms (in increments of 10). |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Setting the packet transmission interval to **1000** ms on interface **1/1/1**.

```
switch(config)# interface 1/1/1
switch(config-if)# udld interval 1000
```

Setting the packet transmission interval on interface **1/1/1** to the default value.

```
switch(config)# interface 1/1/1
switch(config-if)# no udld interval
```

Trying to set the packet interval to 1055 ms on interface 1 is rejected because the interval must be specified as a multiple of 10:

```
switch(config)# interface 1
switch(config-if)# udld interval 1055
Invalid interval. The interval value must be between 20ms and 90000ms and should
be
specified as a multiple of 10, for example: 20, 100, 3000 or 90000.
```

Trying to set the packet interval to less than 7000 ms on interface 1 is rejected if using the RFC5171 mode.

```
switch(config)# interface 1
switch(config-if)# udld mode rfc5171 normal
switch(config-if)# udld interval 1000
Invalid interval. The interval must be equal or greater than 7000ms.
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## udld mode

```
udld mode aruba-os {verify-then-forward | forward-then-verify}
udld mode rfc5171 <RFC5171-MODE>
no udld mode [[aruba-os [verify-then-forward | forward-then-verify]] | [rfc5171
[<RFC5171-MODE>]]]
```

### Description

Sets the operating mode.

The **no** form of this command sets the operating mode to the default value of **aruba-os** and **forward-then-verify**.

| Parameter | Description |
|---|---|
| `aruba-os {verify-then-forward | forward-then-verify}` | Selects the ArubaOS mode to use. Use this mode when interconnecting with HPE PVOS/Brocade/Foundry switches. |
| `verify-then-forward` | In this mode:<br>■ Interfaces start as unblocked. |

| Parameter | Description |
|---|---|
| | ■ Once an interface is determined to be bidirectional, it is blocked if the retry limit is reached without receiving any UDLD packets.<br>■ Interfaces automatically unblock if a UDLD packet is received.<br>■ On failover, the UDLD state does not change if the (interval * retries) time is around 6 seconds. |
| `forward-then-verify` | In this mode:<br>■ Interfaces start as unblocked.<br>■ Interfaces transition to the unblocked state when receiving UDLD packets.<br>■ Once an interface is determined to be bidirectional, it is blocked if the retry limit is reached without receiving any UDLD packets.<br>■ Interfaces automatically unblock if a UDLD packet is received. |
| `rfc5171` *`<RFC5171-MODE>`* | Selects the RFC5171 mode to use. Use this mode when interconnecting with third-party switches. |
| `normal` | In this mode:<br>■ Interfaces start as unblocked.<br>■ Interfaces do not block when the retry limit is reached without receiving any UDLD packets (plus 8 extra packets sent to the peer). Instead, an event is generated.<br>■ Interfaces automatically unblock if a UDLD packet is received. |
| `aggressive` | In this mode:<br>■ Interfaces start as unblocked.<br>■ Once an interface is determined to be bidirectional, an interface will block when the retry limit is reached without receiving any UDLD packets (plus 8 extra packets sent to the peer).<br>■ Interfaces implement a limited/reduced errDisabled recovery mechanism. When the interface's state goes to errDisabled, a maximum of 3 attempts (5 minutes apart) are triggered to try and bring up the interface in case the remote endpoint is still sending UDLD packets. After these 3 retries, the interface will remain blocked even if UDLD packets are received. The only way to unblock the interface when this occurs is to disable (and optionally re-enable) UDLD on the interface. The retry limit is reset once the interface becomes unblocked. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Setting the operating mode to **aruba-os** and **forward-then-verify** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# udld mode aruba-os forward-then-verify
```

Setting the operating mode to **rfc5171** and **aggressive** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# udld mode rfc5171 aggressive
```

Setting the operating mode on interface **1/1/1** to the default value:

```
switch(config)# interface 1/1/1
switch(config-if)# no udld mode
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## udld retries

```
udld retries <COUNT>
no udld retries [<COUNT>]
```

### Description

Sets the UDLD retry count.

The **no** form of this command sets the retry count to the default of 4.

| Parameter | Description |
|---|---|
| *<COUNT>* | Specifies the UDLD retry count. Range: 3 to 10. Default: 4. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Setting the UDLD retry count to **5** on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# udld retries 5
```

Setting the UDLD retry count on interface **1/1/1** to the default value:

```
switch(config)# interface 1/1/1
switch(config-if)# no udld retries
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

# Chapter 159

# UFD (Uplink Failure Detection) commands

## debug ufd all

```
debug ufd all
no debug ufd all
```

### Description

Enables the UFD debug logs.

The no form of this command disables the UFD debug logs.

### Examples

Enabling UFD debug logs:

```
switch(config)# debug ufd all
```

Disabling UFD debug logs:

```
switch(config)# no debug ufd all
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## delay

```
delay {down | up} <DELAY>
no delay {down | up} <DELAY>
```

### Description

Within the selected UFD (Uplink Failure Detection) session context, specifies the amount of time (in seconds) to delay before bringing up or down the configured Links to Disable (LtD) after the corresponding Links to Monitor (LtM) come back up or go down.

For example, with **delay down 10**, when **all LtM links go down** and remain down after 10 seconds, UFD disables the interfaces/LAGs configured as Links-to-Disable (LtD). Similarly, with **delay up 10**, If **any of the LtM links come back up** and remain up after 10 seconds, then all the LtD links are brought back up.

In addition to any configured delay there is an additional delay of 3 to 5 seconds before bringing any Links-to-Disable (LtD) down or back up. So with the default delay of 0 seconds, a delay of 3 to 5 seconds does occur.

The no form of this command restores the delay to its default of 0 seconds.

| Parameter | Description |
|---|---|
| *<DELAY>* | Species the delay in seconds. Range 0 to 180 seconds. Default: 0 seconds. |

## Examples

Setting the up and down delays to 10 seconds:

```
switch(config)# ufd enable
switch(config)# ufd session-id 1
switch(config-ufd-1)# links-to-monitor 1/1/1,1/1/2
switch(config-ufd-1)# links-to-disable 1/1/11,1/1/12
switch(config-ufd-1)# delay down 10
switch(config-ufd-1)# delay up 10
switch(config-ufd-1)# exit
switch(config)#
```

Resetting the up and down delays to their default of 0:

```
switch(config-ufd-1)# no delay down 10
switch(config-ufd-1)# no delay up 10
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config-ufd-*<ID>* | Administrators or local user group members with execution rights for this command. |

# links-to-disable

```
links-to-disable <IF/LAG-LIST>
no links-to-disable <IF/LAG-LIST>
```

## Description

Within the selected UFD (Uplink Failure Detection) session context, specifies the interfaces or LAGs to disable when the monitored uplink interfaces go down.

For proper UFD operation, **links-to-disable** and **links-to-monitor** must both be configured. Use command **links-to-monitor** to specify a corresponding list of interfaces/LAGs to monitor.

The no form of this command deletes the specified links to disable list within the selected UFD session context.

A LAG member interface cannot be added as a link to disable. A interface configured as a link to disable cannot be added as a LAG member interface.

| Parameter | Description |
|---|---|
| *<IF/LAG-LIST>* | List of L2 interfaces or LAGs. Separate interfaces/LAGs with commas (for individual interfaces/LAGs) or hyphens (for a consecutive range of interfaces/LAGs). |

## Examples

Configuring two links to be disabled:

```
switch(config)# ufd enable
switch(config)# ufd session-id 1
switch(config-ufd-1)# links-to-monitor 1/1/1,1/1/2
switch(config-ufd-1)# links-to-disable 1/1/11,1/1/12
switch(config-ufd-1)# delay down 10
switch(config-ufd-1)# delay up 10
switch(config-ufd-1)# exit
switch(config)#
```

Configuring a range of interfaces to disable:

```
switch(config)# ufd session-id 2
switch(config-ufd-2)# links-to-monitor lag18-lag20
switch(config-ufd-2)# links-to-disable 1/1/3-1/1/5
switch(config-ufd-2)# exit
switch(config)#
```

Deleting the links to disable for two interfaces:

```
switch(config-ufd-1)# no links-to-disable 1/1/11,1/1/12
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-ufd-<ID>` | Administrators or local user group members with execution rights for this command. |

## links-to-monitor

```
links-to-monitor <IF/LAG-LIST>
no links-to-monitor <IF/LAG-LIST>
```

### Description

Within the selected UFD (Uplink Failure Detection) session context, specifies the uplink interfaces or LAGs to monitor for UFD.

For proper UFD operation, **links-to-monitor** and **links-to-disable** must both be configured. Use command **links-to-disable** to specify a corresponding list of interfaces/LAGs to disable if the monitored uplinks go down.

The no form of this command deletes the specified links to monitor list within the selected UFD session context.

A LAG member interface cannot be added as a link to monitor. A interface configured as a link to monitor cannot be added as a LAG member interface.

| Parameter | Description |
|---|---|
| *<IF/LAG-LIST>* | List of L2 interfaces or LAGs. Separate interfaces/LAGs with commas (for individual interfaces/LAGs) or hyphens (for a consecutive range of interfaces/LAGs). |

### Examples

Configuring two uplinks to monitor for UFD session 1:

```
switch(config)# ufd enable
switch(config)# ufd session-id 1
switch(config-ufd-1)# links-to-monitor 1/1/1,1/1/2
switch(config-ufd-1)# links-to-disable 1/1/11,1/1/12
switch(config-ufd-1)# delay down 10
switch(config-ufd-1)# delay up 10
switch(config-ufd-1)# exit
switch(config)#
```

Configuring a range of uplink LAGs to monitor for UFD session 2:

```
switch(config)# ufd session-id 2
switch(config-ufd-2)# links-to-monitor lag18-lag20
switch(config-ufd-2)# links-to-disable 1/1/3-1/1/5
switch(config-ufd-2)# exit
switch(config)#
```

Deleting both links to monitor for UFD session 1:

```
switch(config-ufd-1)# no links-to-monitor 1/1/1,1/1/2
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-ufd-<ID>` | Administrators or local user group members with execution rights for this command. |

## show capacities ufd

```
show capacities ufd
show capacities-status ufd
```

### Description

Command **show capacities ufd** shows UFD session capacity. Command **show capacities-status ufd** shows UFD session capacity and the number of UFD sessions configured.

### Example

Showing UFD session capacity:

```
switch# show capacities ufd

System Capacities: Filter UFD
Capacities Name                                                              Value
----------------------------------------------------------------------------------
---
Maximum number of Uplink Failure Detection sessions configurable in a system  128
```

Showing UFD session capacity and the number of UFD sessions configured:

```
switch(config)# show capacities-status ufd

System Capacities Status: Filter UFD
Capacities Status Name                                                Value
Maximum
----------------------------------------------------------------------------------
---
Number of Uplink Failure Detection sessions currently configured        1    128
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show running-config ufd

```
show running-config ufd
```

## Description

Shows the running configuration for UFD.

## Example

Showing the UFD portion of running configuration information:

```
switch(config)# ufd enable
switch(config)# ufd session-id 1
switch(config-ufd-1)# links-to-monitor 1/1/1,1/1/2
switch(config-ufd-1)# links-to-disable 1/1/11,1/1/12
switch(config-ufd-1)# delay down 10
switch(config-ufd-1)# delay up 10
switch(config-ufd-1)# exit
switch(config)#

switch# show running-config ufd
Current configuration:
ufd enable

ufd session-id 1
    delay up 10
    delay down 10
    links-to-monitor 1/1/1,1/1/2
    links-to-disable 1/1/11,1/1/12
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show-tech ufd

```
show-tech ufd
```

### Description

Executes the **show ufd** command followed by the **show running-config ufd** command.

### Example

Running the **show ufd** command followed by the **show running-config ufd** command:

```
switch# show tech ufd
====================================================
Show Tech executed on Tue Nov 23 11:32:08 2021
====================================================
====================================================
[Begin] Feature ufd
====================================================


*********************************
Command : show ufd
*********************************
Global UFD Status : Enabled

UFD session-id                   : 10
UFD Links-to-Monitor status      : Up
Up Delay                         : 20 sec
Down Delay                       : 10 sec
Links-to-Monitor                 : None
Links-to-Disable                 : None
Last Links-to-Monitor Down Time  : None
```

```
UFD session-id                  : 20
UFD Links-to-Monitor status     : Up
Up Delay                        : 0 sec
Down Delay                      : 0 sec
Links-to-Monitor                : None
Links-to-Disable                : None
Last Links-to-Monitor Down Time : None

*********************************
Command : show running-config ufd
*********************************
ufd enable
ufd session-id 10
    delay down 10
    delay up 20
    exit
ufd session-id 20
    exit
====================================================
[End] Feature ufd
====================================================


====================================================
Show Tech commands executed successfully
====================================================
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show ufd

```
show ufd [session-id <ID>]
```

### Description

Shows information on all UFD sessions or the specified UFD session.

| Parameter | Description |
|---|---|
| *<ID>* | Specifies an existing UFD session ID. Range: 1 to 128. |

## Example

Showing information on all configured UFD sessions:

```
switch# show ufd
Global UFD Status : Enabled

UFD session-id                     : 1
UFD Links-to-Monitor status        : Up
Up Delay                           : 10 sec
Down Delay                         : 10 sec
Links-to-Monitor                   : 1/1/1,1/1/2
Links-to-Disable                   : 1/1/11,1/1/12
Last Links-to-Monitor Down Time    : 2021-11-03 15:22:05:37

UFD session-id                     : 2
UFD Links-to-Monitor status        : Up
Up Delay                           : 5 sec
Down Delay                         : 5 sec
Links-to-Monitor                   : lag18-lag20
Links-to-Disable                   : 1/1/3-1/1/5
Last Links-to-Monitor Down Time    : 2021-11-01 12:14:42:56
```

Showing information on UFD session 2:

```
switch# show ufd session 2

UFD session-id                     : 2
UFD Links-to-Monitor status        : Up
Up Delay                           : 5 sec
Down Delay                         : 5 sec
Links-to-Monitor                   : lag18-lag20
Links-to-Disable                   : 1/1/3-1/1/5
Last Links-to-Monitor Down Time    : 2021-11-01 12:14:42:56
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# ufd enable

```
ufd enable
```

```
no ufd enable
```

### Description

Enables UFD (Uplink Failure Detection). UFD is disabled by default. This command must be issued before the configuration that is set with related UFD commands takes effect.

The no form of this command disables UFD.

### Examples

Enabling UFD:

```
switch(config)# ufd enable
switch(config)# ufd session-id 1
switch(config-ufd-1)# links-to-monitor 1/1/1,1/1/2
switch(config-ufd-1)# links-to-disable 1/1/11,1/1/12
switch(config-ufd-1)# delay down 10
switch(config-ufd-1)# delay up 10
switch(config-ufd-1)# exit
switch(config)#
```

Disabling UFD:

```
switch(config)# no ufd enable
```

For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## ufd session-id

```
ufd session-id <ID>
no ufd session-id <ID>
```

### Description

Creates the specified UFD (Uplink Failure Detection) session and then enters its context. If the specified session already exists, this command enters its context.

The no form of this command deletes the specified session configuration.

| Parameter | Description |
|---|---|
| *<ID>* | Specifies the UFD session ID. Range: 1 to 128. |

### Examples

Creating UFD session 1 and then entering its context:

```
switch(config)# ufd enable
switch(config)# ufd session-id 1
switch(config-ufd-1)# links-to-monitor 1/1/1,1/1/2
switch(config-ufd-1)# links-to-disable 1/1/11,1/1/12
switch(config-ufd-1)# delay down 10
switch(config-ufd-1)# delay up 10
switch(config-ufd-1)# exit
switch(config)#
```

Creating UFD session 2 and then entering its context:

```
switch(config)# ufd session-id 2
switch(config-ufd-2)# links-to-monitor lag18-lag20
switch(config-ufd-2)# links-to-disable 1/1/3-1/1/5
switch(config-ufd-2)# exit
switch(config)#
```

Deleting UFD session 1:

```
switch(config)# no ufd session-id 1
```

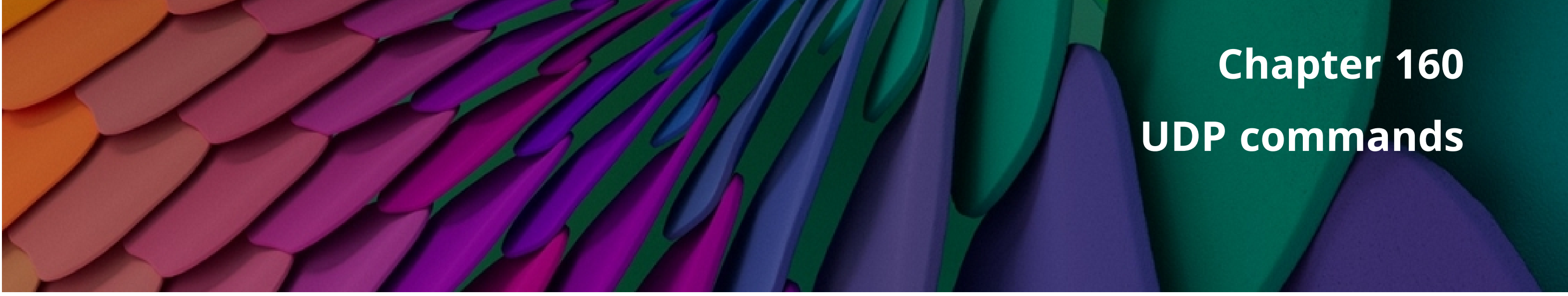
For more information on features that use this command, refer to the Link Aggregation Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | config | Administrators or local user group members with execution rights for this command. |



# Chapter 160
# UDP commands

## ip forward-protocol udp

```
ip forward-protocol udp <IPV4-ADDR> {<PORT-NUM> | <PROTOCOL>}
no ip forward-protocol udp
```

### Description

Defines the UDP server to which the interface forwards ingress UDP broadcast packets received on a specific UDP port. A maximum of 8 UDP broadcast servers can be configured per interface.

The **no** form of this command removes traffic forwarding for the specified server and port/protocol.

| Parameter | Description |
|---|---|
| *<IPV4-ADDR>* | Specifies the UDP server IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255. |
| *<PORT-NUM>* | Specifies the UDP port number for which traffic is forwarded. |
| *<PROTOCOL>* | Specifies the protocol name for which traffic is forwarded. Supported protocols and their port numbers are:<br>■ dns (53): Domain Name Service<br>■ ntp (123): Network Time Protocol<br>■ netbios-ns (137): NetBIOS Name Service<br>■ netbios-dgm (138): NetBIOS Datagram Service<br>■ radius (1812): Remote Authentication Dial-In User Service<br>■ radius-old (1645): Remote Authentication Dial-In User Service<br>■ rip (520): Routing Information Protocol<br>■ snmp (161): Simple Network Management Protocol<br>■ snmp-trap (162): Simple Network Management Protocol<br>■ tftp (69): Trivial File Transfer Protocol<br>■ timep (37): Time Protocol |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Forwarding DNS traffic to server 192.168.1.10 on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# ip udp-bcast-forward protocol udp 192.168.1.10 dns
```

Forwarding DNS traffic (port 53) to server 192.168.1.10 on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# ip udp-bcast-forward protocol udp 192.168.1.10 53
```

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## ip udp-bcast-forward

```
ip udp-bcast-forward
no ip udp-bcast-forward
```

### Description

Enables UDP broadcast forwarding.

The **`no`** form of this command disables UDP broadcast forwarding.

### Examples

Enabling UDP broadcast forwarding:

```
switch(config)# ip udp-bcast-forward
```

Disabling UDP broadcast forwarding:

```
switch(config)# no ip udp-bcast-forward
```

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show ip forward-protocol udp

```
show ip forward-protocol udp [<INTERFACE-NAME>] [vsx-peer]
```

### Description

Shows the configured UDP forwarding settings for all interfaces or a specific interface.

| Parameter | Description |
|---|---|
| *<INTERFACE-NAME>* | Specifies the name of an interface. Format: member/slot/port. |
| [vsx-peer] | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing the configured UDP forwarding settings for all interfaces:

```
switch# show ip forward-protocol udp
UDP Broadcast Forwarder : enabled

Interface: 1/1/1
IP Forward Address UDP Port
-----------------------------
2.2.2.2 1645
4.4.4.4 138
4.4.4.4 1812
1.1.1.1 53
8.1.1.1 123
8.1.1.1 137
Interface: 1/1/2
IP Forward Address UDP Port
-----------------------------
2.2.2.2 37
2.2.2.2 69
2.2.2.2 520
2.2.2.2 161
2.2.2.2 162
```

Showing the configured UDP forwarding settings for a specific interface:

```
switch# show ip forward-protocol udp interface 1/1/1
UDP Broadcast Forwarder : enabled

Interface: 1/1/1
IP Forward Address UDP Port
-------------------------------
2.2.2.2 1645
4.4.4.4 138
4.4.4.4 1812
1.1.1.1 53
8.1.1.1 123
8.1.1.1 137
```

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# Chapter 161

# User and group commands

## password complexity

```
password complexity
no password complexity
```

### Description

Enters the password-complexity context (shown in the switch prompt as **config-pwd-cplx**) for the purpose of enabling and configuring password complexity. Password complexity enhances security by enforcing specific password complexity requirements. Password complexity is disabled by default and must be enabled by execution of the **enable** command.

Enabling or changing password complexity settings effects password creation or password change after the password complexity feature is enabled or changed. All existing passwords will continue to function as currently configured. When existing passwords are changed they will have to comply with whatever password complexity settings are enabled at the time of the change.

The **no** form of this command reverts all settings to their default values and disables password complexity enforcement.

To ensure that enhanced security is maintained, it is recommended that you do not set any values to less than their defaults.

Password complexity apples only to local authentication. For remote authentication, you may choose to set up an equivalent of password complexity according to whatever is supported on your particular TACACS+ or RADIUS server.

### Subcommands

These subcommands are available within the password complexity context (shown in the switch prompt as **config-pwd-cplx**).

`enable`

Enables password complexity enforcement. The enforcement only applies to passwords created after this enabling. Existing passwords are not checked against password complexity.

`disable`

Disables password complexity enforcement.

`[no] history-count **<COUNT>**`

Specifies the number of previous passwords checked to prevent excessive reuse. Not applicable when adding new users. The **no** form of this subcommand resets the value to its default. Default: 5. Range: 1 to 5.

Previous passwords checked includes passwords used prior to enabling the password complexity feature.

`[no] minimum-length **<LENGTH>**`

Specifies the minimum password length. The no form of this subcommand resets the value to its default. Default: 8. Range: 1 to 32.

`[no] position-changes` **`<POSITIONS>`**

Specifies the minimum number of characters that must change in the new password compared to the previous password. Not applicable if no previous password exists, including when adding new users. The no form of this subcommand resets the value to its default. Default: 8. Range: 1 to 32.

The number of password position changes is based on the number of simple character insertions, deletions, or replacements. For example:

Old password: abCD4$ New password: abCD$ Position changes=1 ("4" deleted) Old password: abCD4$ New password: abCDEF4$ Position changes=2 ("EF" inserted) Old password: abCD4$ New password: ebCD4Position changes=2 ("a" replaced with "e," "1" added) Old password: abCD4$ New password: abC$# Position changes=3 ("D4" deleted, "#" added)

`[no] lowercase-count` **`<COUNT>`**

Specifies the minimum lowercase character count for new passwords. The no form of this subcommand resets the value to its default. Default: 1. Range: 0 to 32.

`[no] uppercase-count` **`<COUNT>`**

Specifies the minimum uppercase character count for new passwords. The no form of this subcommand resets the value to its default. Default: 1. Range: 0 to 32.

`[no] numeric-count` **`<COUNT>`**

Specifies the minimum numeric digit count for new passwords. The no form of this subcommand resets the value to its default. Default: 1. Range: 0 to 32.

`[no] special-char-count` **`<COUNT>`**

Specifies the minimum special character count for new passwords. The no form of this subcommand resets the value to its default. Default: 1. Range: 0 to 32.

`[no] adjacent-char-type-count`

Specifies the maximum number of adjacent characters from a character set allowed in a password. The different character sets are:

- Numbers

- Lowercase alphabets

- Uppercase alphabets

- Special characters

The number of adjacent characters from the character set in the password has to be less than or equal to the configured value. When set to 0, adjacent character type length check requirement is disabled. The no form of this subcommand resets the value to its default. Default: 0. Range: 0-31.

`list`

List the subcommands available within the password complexity context.

`exit`

Exits the password complexity context.

`end`

Exits the password complexity context and then the config context.

## Usage

- Password complexity is only for use with plaintext passwords. With password complexity enabled, existing ciphertext passwords will continue working until a password is changed. All new passwords must be entered in plaintext form and be compliant with your password complexity configuration.
- The effective minimum password length may be larger than the configured **minimum-length** value. The effective minimum password length is calculated as follows:

```
LARGEST-of:(minimum-length, position-changes,(SUM-of:lowercase-count+uppercase-
count+numeric-count+special-char-count))
```

For example, with **minimum-length=8**, and **position-changes=10** (and the sum of the other four count settings **<=9**), the **effective minimum-length is 10** (because **position-changes** is largest). Similarity, with a **minimum-length=12**, **position-changes=8**, **lowercase-count=8**, **uppercase-count=4**, **numeric-count=1**, **special-char-count=1**, the **effective minimum-length is `14`** (**8+4+1+1=14**) (because sum off the four counts is largest).

## Examples

Configuring password complexity settings with an effective minimum length of 10 (because **position-changes** is 10):

```
switch(config)# password complexity
switch(config-pwd-cplx)# history-count 3
switch(config-pwd-cplx)# minimum-length 8
switch(config-pwd-cplx)# position-changes 10
switch(config-pwd-cplx)# lowercase-count 2
switch(config-pwd-cplx)# uppercase-count 2
switch(config-pwd-cplx)# numeric-count 2
switch(config-pwd-cplx)# special-char-count 2
switch(config-pwd-cplx)# adjacent-char-type-count 3
switch(config-pwd-cplx)# enable
switch# exit
```

Configuring password complexity settings with an effective minimum length of 14 (because the sum of the four count items is 14):

```
switch(config)# password complexity
switch(config-pwd-cplx)# history-count 4
switch(config-pwd-cplx)# minimum-length 12
switch(config-pwd-cplx)# position-changes 8
switch(config-pwd-cplx)# lowercase-count 8
switch(config-pwd-cplx)# uppercase-count 4
switch(config-pwd-cplx)# numeric-count 1
switch(config-pwd-cplx)# special-char-count 1
switch(config-pwd-cplx)# adjacent-char-type-count 3
switch(config-pwd-cplx)# enable
switch# exit
```

Enabling password complexity (with default settings) and changing a user (admin1) password successfully but failing to change another user (admin2) password due to not meeting complexity requirements:

```
switch(config)# password complexity
switch(config-pwd-cplx)# enable
switch(config-pwd-cplx)# exit
switch(config)#
switch(config)# user admin1 password
Changing password for user admin1
Enter old password:************
Enter new password:************
Confirm new password:************
switch(config)#
switch(config)# user admin2 password
Changing password for user admin2
Enter old password:************
Enter new password:************
Confirm new password:************
```

```
User password not changed.
The new password does not meet one or more of the following complexity
requirements:
Minimum length          : 8
Position changes        : 8
Numeric count           : 1
Lowercase count         : 1
Uppercase count         : 1
Special character count : 1
Adjacent character type count: 3
```

With password complexity already enabled, attempting to change an existing user password but failing because the new password is identical to a recently used one (**history-count**).

```
switch(config)# user admin1 password
Changing password for user admin1
Enter old password:************
Enter new password:************
Confirm new password:************
User password not changed.
The new password is the same as a recently used password.
```

With password complexity already enabled, creating a new admin user (admin3) with a plaintext password that meets complexity requirements.

```
switch(config)# user admin3 group administrators password
Adding user admin3
Enter password:************
Confirm password:************
```

With password complexity already enabled, attempting to create a new admin user (admin4) with a ciphertext password but failing because ciphertext passwords are not supported with password complexity enabled.

```
switch(config)# user admin4 group administrators password ciphertext AQBapPd...==
Ciphertext passwords cannot be used when password complexity is enabled.
switch(config)#
```

## Command History

| Release | Modification |
|---|---|
| 10.11.1010 | **adjacent-char-type-count** subcommand added. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# user

```
user <USERNAME> group {administrators | operators | auditors | <USER-GROUP>}
     password [ciphertext <CIPHERTEXT-PASSWORD> | plaintext <PLAINTEXT-PASSWORD>]
no user <USERNAME>
```

## Description

Creates a user and adds the user to one of the user groups. Users are given the privileges of their group. For the three built-in user groups (**administrators**, **operators**, **auditors**), the privileges are fixed. For user-defined local user groups, the privileges are defined by the CLI command authorization rules of the group.

When entered without either optional **ciphertext** or **plaintext** parameters, the cleartext password is prompted for twice, with the characters entered masked with "*" symbols.

The **no** form of this command removes a user account from the switch. The administrator cannot delete the user account from which they are logged in. The **admin** user cannot be deleted.

| Parameter | Description |
|---|---|
| *<USERNAME>* | Specifies the user name. Requirements:<br>Must start with a lowercase or uppercase letter.<br>Can contain numbers, lowercase, and uppercase letters.<br>Can include only these three special characters: hyphens ( - ), dots ( . ), and underscores ( _ ).<br>Can have a maximum of 32 characters.<br>Cannot be empty.<br>Cannot be: admin, `root`, or `remote_user`.<br>Cannot be Linux reserved names such as: `daemon`, `bin`, `sys`, `sync`, `proxy`, `www-data`, `backup`, `list`, `irc`, `gnats`, `nobody`, `systemd-bus-proxy`, `sshd`, `messagebus`, `rpc`, `systemd-journal-gateway`, `systemd-journal-remote`, `systemd-journal-upload`, `systemd-timesync`, `systemd-coredump`, `systemd-resolve`, `rpcuser`, `vagrant`, `opsd`, `rdanet`, `_lldpd`, `rdaadmin`, `rdaweb`, `docker_container`, `tss`.<br>**NOTE**: Usernames containing the same consecutive letters with varying capitalization, such as Admin, ADMIN, and aDmin, will each be treated as different customer-configured user accounts. |
| `group` | Selects the local user group to which the new user will be assigned. |
| `administrators \| operators \| auditors` | Selects one of three built-in local user groups. |
| *<USER-GROUP>* | Specifies an existing user-defined local user group. |
| `ciphertext` *<CIPHERTEXT-PASSWORD>* | Specifies a ciphertext password. No password prompts are provided and the ciphertext password is validated before the configuration is applied for the user. The variable *<CIPHERTEXT-PASSWORD>* is Base64 and is typically copied from another switch using the `show running-config` command output and then pasted into this command. |

| Parameter | Description |
|---|---|
| | **NOTE:** The administrator cannot construct ciphertext passwords themselves. The ciphertext is only created by an AOS-CX switch. The ciphertext is created by setting a password for a user with the `user` command. The ciphertext is available for copying from the `show running-config` output and pasting into the configuration on any other AOS-CX switch. The target switch must have the same export password (default or otherwise) as the source switch. |
| `plaintext <PLAINTEXT-PASSWORD>` | Specifies the password without prompting. The password is visible as cleartext when entered but is encrypted thereafter. Command history does show the password as cleartext. |

## Usage

- Up to 63 local users can be added, for a total of 64 users including the default user **admin**. A user can belong to only one group.
- The switch ships with the **admin** user account and three built-in local user groups: **administrators**, **operators**, and **auditors**. The **admin** account belongs to the **administrators** group. The Service OS also includes the administrator user **admin**. The two admin users are entirely distinct.
- When a local user account is removed, the user loses all active login/SSH sessions. Any calls on the existing REST session with that local user account fail with a permissions issue as soon as the user is deleted. Soon afterwards, the existing REST sessions with the deleted local user account become invalidated. If a user is viewing the GUI while their account is deleted, the user is redirected to the login page within 60 seconds. The home directory associated with the user is also removed from the switch.
- Cleartext passwords (whether entered with prompting or entered directly) must:
  - Contain only ASCII characters from hexadecimal 21 to hexadecimal 7E [\x21-\x7E] (decimal 33 to 126). Spaces are not allowed. When the password is entered directly without prompting, the "`?`" symbol (hexadecimal 3F [\x3F] (decimal 63)) is not permitted.
  - Contain at most 32 characters.
  - Contain at least the number of characters configured (optionally) for `minimum-password-length`.

Although empty passwords are supported, it is recommended that you use strong passwords for all production switches.

Only an administrator can change the password of a user assigned to the `operators` role.

Although usernames with uppercase letters appear in the show-running configuration, users will not have login access if the username was configured and downgraded to a version without uppercase support.

## Examples

Creating local user **jamie** in the **administrators** group with a prompted password:

```
switch(config)# user jamie group administrators password
Adding user jamie
Enter password:************
Confirm password:************
```

Creating user **chris** in the existing user-defined local user group **admuser2** with a cleartext password, using direct entry without prompting:

```
switch(config)# user chris group admuser2 password plaintext passWORDxJ|989
```

Creating user **alex** in the **operators** group with a ciphertext password (the ciphertext shown is a placeholder that must be replaced with actual ciphertext):

```
switch(config)# user alex group operators password ciphertext NDcDI2...8igJfA=
```

Removing user **jamie**:

```
switch(config)# no user jamie
User jamie's home directory and active sessions will be deleted.
Do you want to continue [y/n]?y
```

Using uppercase letters within username:

```
switch(config)# user TestUser1 group administrators password plaintext testuser1
switch(config)#
```

For more information on features that use this command, refer to the Multicast Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13 | Added support for use of uppercase letters within username. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## user-group

```
user-group <GROUP-NAME>
no user-group <GROUP-NAME>
```

## Description

If **<GROUP-NAME>** does not exist, this command creates a local user group and then enters its context. If **<GROUP-NAME>** exists, this command enters the context for the specified **<GROUP-NAME>**. Within the **<GROUP-NAME>** context, several subcommands are available for working with rules that specify what CLI commands are permitted or denied for all members of the local group.

In addition to the three built-in user groups **administrators**, **operators**, and **auditors**, up to 29 user-defined local user groups can be defined. All users can be members of only one of the up to 32 groups.

The **no** form of this command deletes the specified user group. All members of the deleted group lose all command authorization privilege.

| Parameter | Description |
|---|---|
| *<GROUP-NAME>* | Specify a user group name up to 32 characters long. A new group is created if the specified group does not exist and then the group context is entered. If the group name exists, its context is entered. |

Do not causally delete user-defined local user groups without understanding the implications. Although user-defined local user groups can be deleted with the respective members losing all privileges, the three built-in groups `administrators`, `operators`, and `auditors` are always available and their privileges are unchangeable.

## Subcommands

These subcommands are available within the user-defined local user group context (shown in the switch prompt as **config-usr-grp-<*GROUP-NAME*>**).

```
[<SEQ-NUM>] {permit | deny} cli command "<REGEX>"
no <SEQ-NUM>
```

Defines a CLI command privilege **permit** or **deny** rule. There is an implicit **"deny .*"** rule at the end of every user-defined group rule list. Members of a user-defined group without any **permit** rules have no CLI command privileges.

The no form of this subcommand deletes the specified (by sequence number) rule from the group.

Rule evaluation proceeds from lowest to highest sequence number until the first successful match, resulting in either CLI command permission or denial. Rule evaluation ceases upon first match. Therefore, rules for related CLI commands must be defined in most restrictive to least restrictive order.

*<SEQ-NUM>*

Specifies the CLI command rule sequence number. When omitted, a sequence number that is 10 greater the highest existing sequence number is auto-assigned. When no rules exist, the first auto-assigned sequence number is 10.

**{permit | deny}**

Sets the rule type as either **permit** or **deny**. Rule order is important. For example, these two related rules together authorize all **show** commands except for the **show aaa** commands.

```
switch(config-usr-grp-admuser2)#10 deny cli command "show aaa .*"
switch(config-usr-grp-admuser2)#20 permit cli command "show .*"
```

To achieve the wanted effect in this example, the **deny** rule must precede the **permit** rule. These two rules together achieve the following:

- All **show aaa** commands match on rule 10, triggering command denial, and the immediate cessation of further rule evaluation. Matching on rule 20 is never attempted.
- All other **show** commands (excluding **show aaa** commands) match on rule 20 and are therefore permitted.

**<REGEX>**

Specifies the CLI command matching criteria of the rule. The criteria can be expressed as "**.***" which matches all commands. Otherwise, the criteria is expressed as a POSIX-compliant regular expression (regex) string starting with an exact match command token (for example **show**) followed by a regex representing command arguments. The first word must be a string that contains only alphanumeric or hyphen characters.

For example, to allow all commands starting with the word **interface**, the regex must be "**interface .***" or just "**interface**". Using "**interface.***" (without the space) is not supported. For example, "**show .***" matches every **show** command. Consult the Extended regular expression information available at: https://pubs.opengroup.org/onlinepubs/9699919799/basedefs/V1_chap09.html#tag_09_04.

| Sample matching criteria | Sample matched CLI command or specifier | Matches |
|---|---|---|
| `show .*` | `show accounting log` | All **show** commands |
| `bgp .*` | `bgp router-id 1.1.1.1` | All **bgp** commands |
| `interface .*` | `interface 1/1/1` | All interface specifiers |
| `vlan (3\|4)` | `vlan 3` | VLAN 3 or 4 |
| `vlan [1-9]` | `vlan 5` | A single VLAN in the range 1 to 9 |
| `vlan ([1-9]\|1[0-9])` | `vlan 19` | A single VLAN in the range 1 to 19 |

`[<SEQ-NUM>] comment <TEXT-STRING>`
`no <SEQ-NUM> comment`

Adds a comment to an existing rule. The no form of this subcommand removes an existing comment.

```
switch(config-usr-grp-admuser2)# 10 comment Deny all show aaa commands.
switch(config-usr-grp-admuser2)# 20 comment Permit all other show commands.
switch(config-usr-grp-admuser2)#
switch(config-usr-grp-admuser2)# show running-config current-context
user-group admuser2
    10 comment Deny all show aaa commands.
    10 deny cli command "show aaa .*"
    20 comment Permit all other show commands.
    20 permit cli command "show .*"
```

`include <GROUP-NAME> [no] include <GROUP-NAME>`

Include all rules from the specified user-defined ***<GROUP-NAME>***. Only one group can be included in the definition of another group. The content of the included group is effectively placed at the top of the rules list in the current group. If the specified ***<GROUP-NAME>*** does not exist, it is created.

The no form of this subcommand removes the specified included group from the current group. The specified included group must exist and must be included in the current group or else an error message is shown.

The name of the included group is shown at the top of the **show user-group** command for the group with the **include**.

In this example, group **admuser1** is included in group **admuser2**. So the **admuser1** rules are evaluated first and then the rules in the **admuser2** group are only evaluated if no CLI command match occurs for the rules in group **admuser1**.

```
switch(config-usr-grp-admuser2)# include admuser1
switch(config-usr-grp-admuser2)# show user-group admuser2
User Group Summary
==================
Name            : admuser2
Type            : configuration
Included Group  : admuser1
Number of Rules : 2
User Group Rules
================
SEQUENCE NUM  ACTION     COMMAND                       COMMENT
------------- ---------- ----------------------------- ---------------------------
-----
10            deny       show aaa .*                   Deny all show aaa commands.
20            permit     show .*                       Permit all other show
commands.
```

`resequence [<STARTING-SEQ-NUM> <INCREMENT>]`

Resequences the CLI command authorization rules. When entered without the optional parameters the rules are resequenced with a ***<STARTING-SEQ-NUM>*** of 10 and an ***<INCREMENT>*** of 10.

*<STARTING-SEQ-NUM>*

Specifies the starting sequence number.

*<INCREMENT>*

Specifies the sequence number increment.

Resequencing the rules to start at 100 with an increment of 20:

```
switch(config-usr-grp-admuser2)# resequence 100 20
switch(config-usr-grp-admuser2)# show running-config current-context
user-group admuser2
    100 comment Deny all show aaa commands.
    100 deny cli command "show aaa .*"
    120 comment Permit all other show commands.
    120 permit cli command "show .*"
```

Resequencing the rules to the default of starting at 10 with an increment of 10:

```
switch(config-usr-grp-admuser2)# resequence
switch(config-usr-grp-admuser2)# show running-config current-context
user-group admuser2
    10 comment Deny all show aaa commands.
    10 deny cli command "show aaa .*"
    20 comment Permit all other show commands.
    20 permit cli command "show .*"
```

`show running-config current-context`

Shows all the commands used to configure the rules in the current group context.

```
switch(config-usr-grp-admuser2)# show running-config current-context
user-group admuser2
    10 comment Deny all show aaa commands.
    10 deny cli command "show aaa .*"
    20 comment Permit all other show commands.
    20 permit cli command "show .*"
```

`list`

List the subcommands available within the user-defined group context.

`exit`

Exits the user-defined group context.

`end`

Exits the user-defined group context and then the config context.

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## user management-interface

```
user <USERNAME> management-interface <MGMT-INTERFACE>
no user <USERNAME> management-interface <MGMT-INTERFACE>
```

### Description

Enables a management interface for the specified local user. By default, all management interfaces are enabled for all local users.

The **no** form of this command disables the selected management interface for the specified local user.

| Parameter | Description |
|---|---|
| *<USERNAME>* | Specifies the name of an existing local user. |
| *<MGMT-INTERFACE>* | Selects one of the management interfaces: **ssh**, **telnet**, **https-server**, **console**. Note that **https-server** corresponds to the Web UI and REST. |

### Examples

Enabling the SSH management interface for local user **admin1**:

```
switch(config)# user admin1 management-interface ssh
```

Disabling the SSH management interface for local user **admin1**:

```
switch(config)# no user admin1 management-interface ssh
```

Enabling the telnet management interface for local user **admin1**:

```
switch(config)# user admin1 management-interface telnet
```

Disabling the telnet management interface for local user **admin1**:

```
switch(config)# no user admin1 management-interface telnet
```

Enabling the https-server (Web UI) management interface for local user **admin1**:

```
switch(config)# user admin1 management-interface https-server
```

Disabling the https-server (Web UI) management interface for local user **admin1**:

```
switch(config)# no user admin1 management-interface https-server
```

Enabling the console management interface for local user **admisn1**:

```
switch(config)# user admin1 management-interface console
```

Disabling the console management interface for local user **admin1**:

```
switch(config)# no user admin1 management-interface console
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# user password

```
user <USERNAME> password [ciphertext <CIPHERTEXT-PASSWORD> | plaintext <PLAINTEXT-PASSWORD>]
```

## Description

Changes a password for an account or enables the password for the admin account. When entered without either optional **ciphertext** or **plaintext** parameters, the cleartext password is prompted for twice, with the characters entered masked with "*" symbols.

| Parameter | Description |
|---|---|
| `<USERNAME>` | Specifies the corresponding user name for the password you want to change. |
| `ciphertext <CIPHERTEXT-PASSWORD>` | Specifies a ciphertext password. No password prompts are provided and the ciphertext password is validated before the configuration is applied for the user. The variable `<CIPHERTEXT-PASSWORD>` is Base64 and is typically copied from another switch using the `show running-config` command output and then pasted into this command.<br>**NOTE:** The administrator cannot construct ciphertext passwords themselves. The ciphertext is only created by an AOS-CX switch. The ciphertext is created by setting a password for a user with the `user` command. The ciphertext is available for copying from the `show running-config` output and pasting into the configuration on any other AOS-CX switch. The target switch must have the same export password (default or otherwise) as the source switch. |
| `plaintext <PLAINTEXT-PASSWORD>` | Specifies the password without prompting. The password is visible as cleartext when entered but is encrypted thereafter. Command history does show the password as cleartext. |

## Usage

The admin account is available on the switch without a password by default.

Cleartext passwords (whether entered with prompting or entered directly) must:

- Contain only ASCII characters from hexadecimal 21 to hexadecimal 7E [\x21-\x7E] (decimal 33 to 126). Spaces are not allowed. When the password is entered directly without prompting, the "`?`" symbol (hexadecimal 3F [\x3F] (decimal 63)) is not permitted.
- Contain at most 32 characters.
- Contain at least the number of characters configured (optionally) for `minimum-password-length`.

Although empty passwords are supported, it is recommended that you use strong passwords for all production switches.

Only an administrator can change the password of a user assigned to the `operators` role.

Although usernames with uppercase letters appear in the show-running configuration, users will not have login access if the username was configured and downgraded to a version without uppercase support.

### Examples

Enabling (or changing) a cleartext password for **admin**:

```
switch(config)# user admin password
Changing password for user admin
Enter password:************
Confirm password:************
```

Changing the cleartext password for user **chris**, using direct entry without prompting:

```
switch(config)# user chris password plaintext PASSwordZQ#@67
```

Changing the ciphertext password for user **alex** (the ciphertext shown is a placeholder that must be replaced with actual ciphertext):

```
switch(config)# user alex password ciphertext XqYJ36...W83D4Y=
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## service export-password

```
service export-password
no service export-password
```

### Description

Configures a nondefault export password. The export password is used to transform critical security parameters (such as password hashes) into ciphertext suitable for exporting and showing by commands such as **show running-config**. This transformation enables safe switch configuration import and export.

The **no** form of this command reverts the export password to its factory default.

All factory-default switches have identical default export passwords. For security, it is recommended that you set the same nondefault export password on every switch in a group that will exchange configuration information. Only switches with identical export passwords can exchange configuration information.

### Usage

Prompts you twice for the new export password.

The export password must:

- Contain only ASCII characters from hexadecimal 21 to hexadecimal 7E [\x21-\x7E] (decimal 33 to 126). Spaces are not allowed.
- Contain at most 32 characters.
- Not be blank.

### Examples

Configuring a new export password:

```
switch(config)# service export-password
Enter password:************
Confirm password:************
```

Reverting the export password to its factory default:

```
switch(config)# no service export-password
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## show password-complexity

```
show password-complexity
```

## Description

Shows user-configured or default password complexity checking criteria.

## Examples

Showing the current password complexity checking criteria:

```
switch(config)# show password-complexity

Global password complexity checking criteria:
    Password complexity                   : Enabled
    Previous passwords to check           : 3
    Minimum password length               : 12
    Minimum position changes              : 10
    Maximum adjacent characters count     : 3
    Password composition
         Minimum lowercase characters     : 3
         Minimum uppercase characters     : 1
         Minimum special characters       : 1
         Minimum numeric characters       : 3
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show user-group

`show user-group [<GROUP-NAME>] [vsx-peer]`

## Description

Shows user group information for the built-in groups plus any user-defined local user groups. When entered without **`<GROUP-NAME>`**, summary information is shown for all groups.

| Parameter | Description |
|---|---|
| *`<GROUP-NAME>`* | Narrows the **show** command output to that of the specified group, and for local user groups, adds the **User Group Rules** list. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Show the list of all user groups, including built-in groups and local user groups.

```
switch# show user-group
GROUP NAME     GROUP TYPE     INCLUDED GROUP    NUMBER OF RULES
-------------- -------------- ----------------- -------------------
administrators built-in       n/a               n/a
admuser1       configuration  --                5
admuser2       configuration  admuser1          2
auditors       built-in       n/a               n/a
operators      built-in       n/a               n/a
```

Show detailed information for local user group **admuser2**.

```
switch(config-usr-grp-admuser2)# show user-group admuser2
User Group Summary
==================
Name             : admuser2
Type             : configuration
Included Group   : admuser1
Number of Rules  : 2
User Group Rules
================
SEQUENCE NUM  ACTION     COMMAND                       COMMENT
------------- ---------- ----------------------------- ---------------------------
-----
10            deny       show aaa .*                   Deny all show aaa commands.
20            permit     show .*                       Permit all other show
commands.
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show user information

```
show user information
```

### Description

Shows the following information for the logged-in user:

- User name.
- User authentication type: **local**, **RADIUS**, or **TACACS+**.
- User group: **administrators**, **operators**, or **<GROUP-NAME>**. This field is not applicable for remote authenticated users who are mapped to administrators or operators based on their privilege level.
- User privilege level: For the built-in user groups and RADIUS or TACACS+, the role privilege level value is shown. For user-defined user groups, **N/A** is shown.
- User login session: **ssh**, **telnet**, **https-server**, or **console**.

### Examples

Showing information for the **admin** user:

```
switch# show user information
Username              : admin
Authentication type   : Local
User group            : administrators
User privilege level : 15
User login session    : console
```

Showing information for a member of the user-defined local user group **admuser2**:

```
switch# show user information
Username              : admin2-b
Authentication type   : Local
User group            : admuser2
User privilege level : N/A
User login session    : telnet
```

Showing information for a member of **operators**:

```
switch# show user information
Username              : operator
Authentication type   : Local
User group            : operators
User privilege level : 1
User login session    : https-server
```

Showing information for remote RADIUS user **rad_user1** mapped to local user group **administrators**:

```
switch# show user information
Username              : rad_user1
Authentication type   : RADIUS
User group            : administrators
User privilege level : 15
User login session    : telnet
```

Showing information for remote RADIUS user **rad_user2** mapped to local user group **operators**:

```
switch# show user information
Username              : rad_user2
Authentication type   : RADIUS
User group            : operators
User privilege level : 1
User login session   : console
```

Showing information for remote TACACS+ **tac_user1** logged in with **priv-lvl** 15 (mapped to user group **administrators**):

```
switch# show user information
Username             : tac_user1
Authentication type  : TACACS+
User group           : administrators
User privilege level : 15
User login session   : ssh
```

For more information on features that use this command, refer to the Security Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Command now includes **User login session** information in its output |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show user-list

`show user-list [vsx-peer]`

### Description

Shows all configured users and their corresponding group names.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Show the user list from a switch with only the admin user defined.

```
switch# show user-list

USER                         GROUP
---------------------------------------------
admin                        administrators
```

Show the user list after adding a user to the operators built-in group.

```
switch# show user-list

USER                         GROUP
---------------------------------------------
admin                        administrators
oper1                        operators
```

Show the user list after adding a user to the auditors built-in group.

```
switch# show user-list

USER                         GROUP
---------------------------------------------
admin                        administrators
oper1                        operators
audit1                       auditors
```

Show the user list after adding a total of three users to two user-defined user groups.

```
switch# show user-list

USER                         GROUP
---------------------------------------------
admin                        administrators
oper1                        operators
audit1                       auditors
adm1a                        admuser1
admin2-a                     admuser2
admin2-b                     admuser2
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show user-list management-interface

```
show user-list management-interface [vsx-peer]
```

## Description

Shows a list of local users and the enabled management interfaces for each user.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Disabling SSH and https-server for user **admin1**, disabling Telnet for **admin2**, then showing the configuration:

```
switch(config)# no user admin1 management-interface ssh
switch(config)# no user admin1 management-interface https-server
switch(config)# no user admin2 management-interface telnet
switch(config)# show user-list management-interface
USER                         ENABLED MANAGEMENT INTERFACE(S)
------------------------------------------------------------
admin                        ssh,telnet,https-server,console
admin1                       telnet,console
admin2                       ssh, https-server, console
```

Re-enabling https-server for user **admin1**, re-enabling Telnet for **admin2**, then showing the configuration:

```
switch(config)# user admin1 management-interface https-server
switch(config)# user admin2 management-interface telnet
switch(config)# show user-list management-interface
USER                         ENABLED MANAGEMENT INTERFACE(S)
------------------------------------------------------------
admin                        ssh,telnet,https-server,console
admin1                       telnet,https-server,console
admin2                       telnet,https-server,console
```

For more information on features that use this command, refer to the Security Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# Chapter 162

# User-based tunneling commands

## backup-controller ip

```
backup-controller ip <IP-ADDR>
no backup-controller ip <IP-ADDR>
```

### Description

Specifies the IP address of the backup controller for the UBT zone.

The no form of this command deletes the IP address of the backup controller.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* | Specifies the IP address of the backup controller. |

### Examples

Specifying the backup controller ip address for `zone1`:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# backup-controller ip 10.116.51.11
```

Delete the configured backup controller IP address:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# no backup-controller ip 10.116.51.11
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-ubt-<ZONE-NAME>` | Administrators or local user group members with execution rights for this command. |

# enable

```
enable
no enable
```

## Description

Enables the UBT zone.

The **no** form of this command disables the UBT zone.

## Examples

Enabling UBT for zone `zone1`:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# enable
```

Disabling UBT for `zone1`:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# no enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-ubt-<ZONE-NAME>` | Administrators or local user group members with execution rights for this command. |

# ip source-interface

```
ip source-interface {all | ubt} {interface <IFNAME> | <IPV4-ADDR>} [vrf <VRF-NAME>]
no ip source-interface {all | ubt} {interface <IFNAME> | <IPV4-ADDR>} [vrf <VRF-NAME>]
```

## Description

Sets a single source IP address for the UBT zone VRF. This ensures that all traffic sent by UBT zone/VRF has the same source IP address, regardless of how it egresses the switch.

This command provides two ways to set the source IP addresses: either by specifying a static IP address, or by using the address assigned to a switch interface. If you define both options, then the static IP address takes precedence.

The **no** form of this command deletes the single source IP address for UBT.

| Parameter | Description |
|---|---|
| `all` | When used no other parameters are required. |
| `interface <IFNAME>` | Specifies the name of the interface from which UBT obtains its source IP address. The interface must have a valid IP address assigned to it. If the interface has both a primary and secondary IP address, the primary IP address is used. |
| `<IPV4-ADDR>` | Specifies the source IP address to use for UBT. The IP address must be defined on the switch, and it must exist on the specified VRF, Default: default. Specify the address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| `vrf <VRF-NAME>` | Specifies the name of the VRF from which the UBT zone sets its source IP address. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Setting interface 1/1/7 as the source address for UBT for VRF default:

```
switch(config)# ip source-interface ubt interface 1/1/7 vrf default
```

Deleting the configured source interface `1/1/7` as the source address for UBT for VRF `default`:

```
switch(config)# no ip source-interface ubt interface 1/1/7 vrf default
```

Specifying the static IP address `1.1.1.1` as the source address for UBT for VRF `default`:

```
switch(config)# ip source-interface ubt 1.1.1.1 vrf default
```

Deleting the configured ip address as the source address for UBT for VRF `default`:

```
switch(config)# no ip source-interface ubt 1.1.1.1 vrf default
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# papi-security-key

```
papi-security-key [{ciphertext <SEC-KEY> | plaintext <SEC-KEY>}]
no papi-security-key
```

## Description

Specifies the shared security key used to encrypt UBT PAPI messages exchanged between the switch and the controller cluster for the zone.

The **no** form of this command deletes the shared security key .

| Parameter | Description |
|---|---|
| `ciphertext` *`<SEC-KEY>`* | Specifies an encrypted security key. |
| `plaintext` *`<SEC-KEY>`* | Specifies a plaintext security key. Range: 10 to 64 characters.<br>**NOTE:**<br>When the security key is not provided on the command line, plaintext security key prompting occurs upon pressing Enter. The entered security key characters are masked with asterisks.. |

## Examples

Specifying the PAPI security key for UBT zone `zone1` as plaintext:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# papi-security-key plaintext F82#450b
```

Specifying the PAPI security key for UBT `zone2` with plaintext prompting:

```
switch(config)# ubt zone zone2
switch(config-ubt-zone2)# papi-security-key
Enter the PAPI security key: **********
Re-Enter the PAPI security key: **********
```

Specifying the PAPI security key for UBT `zone1` as ciphertext:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# papi-security-key ciphertext AQBapdAVz5...RmH3+4cpg=
```

Removing the PAPI security key for UBT `zone1`:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# no papi-security-key
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-ubt-<ZONE-NAME>` | Administrators or local user group members with execution rights for this command. |

## primary-controller ip

```
primary-controller ip <IP-ADDR>
no primary-controller ip <IP-ADDR>
```

### Description

Specifies the IP address of the primary controller IP address for the zone.

The **no** form of this command deletes the IP address of the primary controller.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* | Specifies the IP address of the primary controller. |

### Examples

Specify the primary controller IP address for `zone1`:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# primary-controller ip 10.116.51.10
```

Delete the configured primary controller IP address:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# no primary-controller ip 10.116.51.10
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-ubt-<ZONE-NAME>` | Administrators or local user group members with execution rights for this command. |

## sac-heartbeat-interval

```
sac-heartbeat-interval <TIME>
no sac-heartbeat-interval <TIME>
```

### Description

Specifies the SAC heartbeat refresh time interval in seconds.

The **no** form of this command sets the heartbeat interval to the default value.

| Parameter | Description |
|---|---|
| *<TIME>* | Specifies the SAC heartbeat refresh time interval in seconds. Range: 1 to 8. Default: 1. |

### Examples

Specifying a heartbeat refresh interval of 1 for UBT `zone1`:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# sac-heartbeat-interval 1
```

Deleting the configured heartbeat refresh interval:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# no sac-heartbeat-interval
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-ubt-<ZONE-NAME>` | Administrators or local user group members with execution rights for this command. |

# show ip source-interface ubt

`show ip source-interface ubt`

## Description

Displays source IP address configuration information for the UBT zone(s).

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing source IP address configuration information:

```
switch(config)# show ip source-interface ubt

Source-interface Configuration Information
----------------------------------------------------------------------
Protocol        Src-Interface       Src-IP                   VRF
----------------------------------------------------------------------
ubt             vlan10              10.1.1.2                 default
ubt             vlan20              20.1.1.2                 blue
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# show capacities ubt

`show capacities ubt`

## Description

Shows the maximum number of UBT clients and zones that can be configured in the system.

## Example

Showing maximum number of UBT clients and zones that can be configured:

```
switch# show capacities ubt

System Capacities: Filter UBT
Capacities Name                                                            Value
--------------------------------------------------------------------------------
Maximum number of UBT clients in a system                                   1017
Maximum number of UBT zones per VRF                                            8
Maximum number of UBT zones                                                    8
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11.1000 | Example updated to show UBT multi-zone support on 6200 Switch Series. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show running-config ubt

`show running-config ubt`

## Description

Shows the current running configuration of UBT.

## Examples

Showing running configuration of ubt in vlan extend mode:

```
switch# show running-config ubt
ubt-mode vlan-extend
ubt zone zone1 vrf default
       primary-controller ip 192.168.1.10
       wol-enable vlan 10, 20-40, 50, 60
       enable
```

Showing running configuration of ubt in local vlan mode:

```
switch# show running-config ubt
ubt-client-vlan 3000
ubt zone zone1 vrf default
       primary-controller ip 192.100.1.10
       backup-controller ip 192.100.1.11
       enable
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show ubt

```
show ubt [brief]
show ubt zone <ZONE-NAME> [brief]
```

### Description

Shows global configuration information for UBT in addition to detailed or brief information for a specific UBT zone.

| Parameter | Description |
|---|---|
| zone *<ZONE-NAME>* | Specifies the name of a zone. Length: 1 to 64 characters. |
| brief | Displays brief information. |

### Examples

Showing global UBT configuration information where local-VLAN mode has been configured:

```
switch# show ubt

Zone Name                  : zone1
UBT Mode                   : local-vlan
Primary Controller         : 10.116.51.10
Backup Controller          : 10.116.51.11
SAC HeartBeat Interval     : 1
UAC KeepAlive Interval     : 60
```

```
VLAN Identifier            : 4094
VRF Name                   : default
Wake-on-LAN Enabled-VLANS  : -NA-
Admin State                : ENABLED
PAPI Security Key          : AQBapdxySvGPvdTl ... bL4FE=
Operational State          : Up

Zone Name                  : zone2
UBT Mode                   : local-vlan
Primary Controller         : 1.1.5.10
Backup Controller          : 1.1.5.11
SAC HeartBeat Interval     : 1
UAC KeepAlive Interval     : 60
VLAN Identifier            : 4094
VRF Name                   : blue
Wake-on-Lan Enabled-VLANS  : -NA-
Admin State                : ENABLED
PAPI Security Key          : TRQapdxySvGPvdTlkYn1 ... zP4FE=
Operational State          : Up
```

Showing global UBT configuration information where VLAN-extend mode has been configured:

```
switch# show ubt

Zone Name                  : zone1
UBT Mode                   : vlan-extend
Primary Controller         : 192.100.1.10
Backup Controller          : 192.100.1.11
SAC HeartBeat Interval     : 1
UAC KeepAlive Interval     : 60
VLAN Identifier            : ---/---
VRF Name                   : default
Wake-on-LAN Enabled-VLANS  : 2-90, 200, 300, 400, 500
Admin State                : ENABLED
PAPI Security Key          : DISABLED
Operational State          : up

Zone Name                  : zone2
UBT Mode                   : vlan-extend
Primary Controller         : 1.1.5.10
Backup Controller          : 1.1.5.11
SAC HeartBeat Interval     : 1
UAC KeepAlive Interval     : 60
VLAN Identifier            : ---/---
VRF Name                   : blue
Wake-on-Lan Enabled-VLANS  : ---/---
Admin State                : ENABLED
PAPI Security Key          : TRQapdxySvGPvdTlkYn1 ... zP4FE=
Operational State          : Up
```

Showing global UBT configuration information where multi-zone has been configured:

```
switch# show ubt

Zone Name                  : zone1
UBT Mode                   : vlan-extend
Primary Controller         : 10.10.10.251
Backup Controller          : ---/---
SAC HeartBeat Interval     : 1
```

```
UAC KeepAlive Interval    : 60
VLAN Identifier           : ---/---
VRF Name                  : default
Wake-on-LAN Enabled-VLANS : ---/---
Admin State               : ENABLED
PAPI Security Key         : DISABLED
Operational State         : Up

Zone Name                 : zone2
UBT Mode                  : vlan-extend
Primary Controller        : 162.10.0.6
Backup Controller         : ---/---
SAC HeartBeat Interval    : 1
UAC KeepAlive Interval    : 60
VLAN Identifier           : ---/---
VRF Name                  : default
Wake-on-LAN Enabled-VLANS : ---/---
Admin State               : ENABLED
PAPI Security Key         : DISABLED
Operational State         : Up

Zone Name                 : zone3
UBT Mode                  : vlan-extend
Primary Controller        : 20.20.20.11
Backup Controller         : ---/---
SAC HeartBeat Interval    : 1
UAC KeepAlive Interval    : 60
VLAN Identifier           : ---/---
VRF Name                  : default
Wake-on-LAN Enabled-VLANS : ---/---
Admin State               : ENABLED
PAPI Security Key         : DISABLED
Operational State         : Up
```

Showing global UBT configuration information with operational state down failure reason:

```
switch# show ubt

Zone Name                 : my-zone
UBT Mode                  : local-vlan
Primary Controller        : 10.116.51.10
Backup Controller         : 10.116.51.11
SAC HeartBeat Interval    : 1
UAC KeepAlive Interval    : 60
VLAN Identifier           : 4094
VRF Name                  : my-vrf
Wake-on-LAN Enabled-VLANS : -NA-
Admin State               : ENABLED
PAPI Security Key         :
AQBapdxySvGPvdTlkYn1/naKX4O3jKHrm28xLYfO6mLOK499BwAAAHdJp/bL4FE=
Operational State         : up

Zone Name                 : my-zone2
UBT Mode                  : local-vlan
Primary Controller        : 10.116.51.10
Backup Controller         : 10.116.51.11
SAC HeartBeat Interval    : 1
UAC KeepAlive Interval    : 60
VLAN Identifier           : 4094
VRF Name                  : my-vrf2
```

```
Wake-on-LAN Enabled-VLANS : -NA-
Admin State               : ENABLED
PAPI Security Key         :
AQBapdxySvGPvdTlkYn1/naKX4O3jKHrm28xLYfO6mLOK499BwAAAHdJp/bL4FE=
Operational State         : down
Failure Reason            : Controller is unreachable
```

Showing brief global UBT configuration information where local-VLAN mode has been configured:

```
switch(config)# show ubt brief
----------------------------------------------------------------------------------
--------------------
Zone Name    UBT Mode         Primary Controller Address    VRF Name     Status
 Operational State
----------------------------------------------------------------------------------
--------------------
zone1        local-vlan       10.116.51.10                  default      Enabled
  up
zone2        local-vlan       20.116.51.20                  vrf2         Enabled
  down
zone3        local-vlan       30.116.51.30                  vrf3         Enabled
  up
```

Showing brief global UBT configuration information where VLAN-extend mode has been configured:

```
switch# show ubt brief
----------------------------------------------------------------------------------
--------------------
Zone Name    UBT Mode         Primary Controller Address    VRF Name     Status
 Operational State
----------------------------------------------------------------------------------
--------------------
zone1        vlan-extend      10.116.51.10                  default      Enabled
  up
zone2        vlan-extend      20.116.51.20                  vrf2         Enabled
  down
zone3        vlan-extend      30.116.51.30                  vrf3         Enabled
  up
```

Showing brief configuration for UBT `zone1` where local-VLAN mode has been configured:

```
switch# show ubt zone zone1 brief
--------------------------------------------------------------------------------
Zone Name    UBT Mode         Primary Controller Address    VRF Name     Status
--------------------------------------------------------------------------------
zone1        local-vlan       10.116.51.10                  default      Enabled
```

Showing brief configuration for UBT `zone1` where VLAN-extend mode has been configured:

```
switch# show ubt zone zone1 brief
--------------------------------------------------------------------------------
Zone Name    UBT Mode         Primary Controller Address    VRF Name     Status
--------------------------------------------------------------------------------
zone1        vlan-extend      10.116.51.10                  default      Enabled
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Wake-on-LAN enabled VLANs added. |
| 10.09 | ■ **Failure Reason** field added in the output of `show ubt` command.<br>■ **Operational State** column added in the output of `show ubt brief` command. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show ubt information

```
show ubt information
show ubt information zone <ZONE-NAME>
```

### Description

Shows SAC and UAC information for UBT. Specifying a zone name displays UBT information for that zone.

| Parameter | Description |
|---|---|
| *ZONE-NAME* | Specifies UBT zone name. Maximum characters: 64. |

### Examples

Showing SAC and UAC information for the tunneled node server:

```
switch(config)# show ubt information

======================================================================
Zone zone1:
======================================================================
SAC Information :

  Active          : 192.168.10.8
  Standby         : -NA-
```

```
Controller is in Standalone mode

Wake-on-LAN VLAN boostrap information:
    Active-SAC registered vlans    :
    Active-SAC failed vlans        : 200
    Active-SAC failure reason      : Failed in controller
    Standby-SAC registered vlans   :
    Standby-SAC failed vlans       :
    Standby-SAC failure reason     :


=====================================================================
Zone zone2:
=====================================================================
SAC Information :

  Active         : 20.1.1.2
  Standby        : 20.1.1.3

Node List Information :

  Cluster Name        : cluster2

  Cluster Alias Name  :

  Node List      :
  ----------------
    20.1.1.2
    20.1.1.3
    20.1.1.4

Bucket Map Information :

Bucket Map Active   : [0...255]

Bucket ID  A-UAC           S-UAC                Connectivity
----------------------------------------------------------
0          20.1.1.2        20.1.1.3             L2
1          20.1.1.3        20.1.1.4             L2
2          20.1.1.4        20.1.1.2             L2
Wake-on-LAN VLAN boostrap information:
    Active-SAC registered vlans    : 10-20,30,40
    Active-SAC failed vlans        :
    Active-SAC failure reason      :
    Standby-SAC registered vlans   : 10-20,30,40
    Standby-SAC failed vlans       :
    Standby-SAC failure reason     :
```

Showing SAC and UAC information for **zone1**:

```
switch(config)# show ubt information zone zone1

=====================================================================
Zone zone1:
=====================================================================
SAC Information :

  Active         : 10.116.51.12
  Standby        : 10.116.51.13
```

```
Node List Information :

  Cluster Name        : my-cluster


  Node List      :
  ----------------
    10.1.1.1
    10.1.1.2
    10.1.1.3

Bucket Map Information :

Bucket Name         : my-bucket
Bucket Map Active   : [0...255]

Bucket ID  A-UAC           S-UAC               Connectivity
----------------------------------------------------------
0          10.1.1.1        10.1.1.2            L2
1          10.1.1.2        10.1.1.3            L2
2          10.1.1.3        10.1.1.1            L2

Wake-on-LAN VLAN boostrap information:
    Active-SAC registered vlans    : 100,300,400
    Active-SAC failed vlans        : 200
    Active-SAC failure reason      : Failed in controller
    Standby-SAC registered vlans   : 100,300,400
    Standby-SAC failed vlans       :
    Standby-SAC failure reason     :
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Wake-on-LAN enabled VLANs added. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show ubt state

```
show ubt state
show ubt state zone <ZONE-NAME>
show ubt state zone <ZONE-NAME> uac-ip <UAC-ADDR>
```

### Description

Shows the global UBT state.

Specifying a zone shows the UBT state of that zone.

Specifying a UAC IP address shows the UBT state of that UAC.

| Parameter | Description |
|---|---|
| `zone <ZONE-NAME>` | Specifies UBT zone name. Maximum characters: 64. |
| `uac-ip <UAC-ADDR>` | Specifies the IP address of the user anchor controller for which to view user information. Specify the address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Showing the UBT state where local-VLAN mode has been configured:

```
switch# show ubt state
=====================================================================
Zone zone1:
=====================================================================
Local Conductor Server (LCS) State:
LCS Type      IP Address    State               Role
---------------------------------------------------------------------
Primary     : 10.1.1.2      ready_for_bootstrap operational_primary
Secondary   : 10.1.1.10     ready_for_bootstrap operational_secondary
Switch Anchor Controller (SAC) State:
              IP Address      MAC Address          State
-----------------------------------------------------------------
Active      : 10.1.1.2        00:0b:86:b7:62:9f    registered
Standby     : 10.1.1.3        00:0b:86:b7:64:0f    registered
User Anchor Controller(UAC): 10.1.1.2
User              Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:01  1/1/1   registered                     5          13       4094
User Anchor Controller(UAC): 10.1.1.3
User              Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:02  1/1/2   registered                     4          14       4094
=====================================================================
Zone zone2:
=====================================================================
Local Conductor Server (LCS) State:
LCS Type      IP Address    State               Role
---------------------------------------------------------------------
Primary     : 20.1.1.2      ready_for_bootstrap operational_primary
Secondary   : 20.1.1.10     ready_for_bootstrap operational_secondary
Switch Anchor Controller (SAC) State:
              IP Address      MAC Address          State
-----------------------------------------------------------------
Active      : 20.1.1.2        00:0b:86:b7:62:9f    registered
Standby     : 20.1.1.3        00:0b:86:b7:64:0f    registered
User Anchor Controller(UAC): 20.1.1.2
User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:03  1/1/1   registered                     5          13       4094
User Anchor Controller(UAC): 20.1.1.3
User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:04  1/1/2   registered                     4          14       4094
```

Showing the UBT state where VLAN-extend mode has been configured:

```
switch# show ubt state
=====================================================================
Zone zone1:
=====================================================================
Local Conductor Server (LCS) State:
LCS Type      IP Address    State               Role
---------------------------------------------------------------------
Primary     : 10.1.1.2      ready_for_bootstrap operational_primary

Secondary   : 10.1.1.10     ready_for_bootstrap operational_secondary
Switch Anchor Controller (SAC) State:
              IP Address      MAC Address          State
-----------------------------------------------------------------
Active      : 10.1.1.2        00:0b:86:b7:62:9f    registered
Standby     : 10.1.1.3        00:0b:86:b7:64:0f    registered
User Anchor Controller(UAC): 10.1.1.2
User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:01  1/1/1   registered                     5          13       10
User Anchor Controller(UAC): 10.1.1.3
User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:02  1/1/2   registered                     4          14       20
=====================================================================
Zone zone2:
=====================================================================
Local Conductor Server (LCS) State:
LCS Type      IP Address    State               Role
---------------------------------------------------------------------
Primary     : 20.1.1.2      ready_for_bootstrap operational_primary
Secondary   : 20.1.1.10     ready_for_bootstrap operational_secondary
Switch Anchor Controller (SAC) State:
              IP Address      MAC Address          State
-----------------------------------------------------------------
Active      : 20.1.1.2        00:0b:86:b7:62:9f    registered
Standby     : 20.1.1.3        00:0b:86:b7:64:0f    registered
User Anchor Controller(UAC): 20.1.1.2
User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:03  1/1/1   registered                     5          13       30
User Anchor Controller(UAC): 20.1.1.3
User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:04  1/1/2   registered                     4          14       40
```

Showing the UBT state of **zone1**:

```
switch# show ubt state zone zone1

=====================================================================
Zone zone1:
=====================================================================
Local Conductor Server (LCS) State:

LCS Type      IP Address    State               Role
---------------------------------------------------------------------
Primary     : 10.1.1.2      ready_for_bootstrap operational_primary
Secondary   : 10.1.1.10     ready_for_bootstrap operational_secondary

Switch Anchor Controller (SAC) State:

              IP Address      MAC Address          State
-----------------------------------------------------------------
Active      : 10.1.1.2        00:0b:86:b7:62:9f    registered
Standby     : 10.1.1.3        00:0b:86:b7:64:0f    registered

User Anchor Controller(UAC): 10.1.1.2

User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:01  1/1/1   registered                     5          13       10

User Anchor Controller(UAC): 10.1.1.3

User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:02  1/1/2   registered                     4          14       20
```

Showing the UBT state of a UAC with IP address `15.212.219.57` where local-VLAN mode has been configured:

```
switch# show ubt state zone zone1 uac-ip 15.212.219.57

User Anchor Controller(UAC): 15.212.219.57

User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:04  1/1/20  registered                     4          14       4000
```

Showing the UBT state of a UAC with IP address **15.212.219.55** where VLAN-extend mode has been configured:

```
switch# show ubt state zone zone1 uac-ip 15.212.219.55

User Anchor Controller(UAC): 15.212.219.55

User               Port    State                          Bucket ID  Gre Key  VLAN
----------------------------------------------------------------------------------
00:00:00:00:00:07  1/1/10  registered                     40          14       20
00:00:00:00:00:08  1/1/12  registered                     28          14       30
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# show ubt statistics

```
show ubt statistics
show ubt statistics zone <ZONE-NAME>
show ubt statistics zone <ZONE-NAME> uac-ip <UAC-ADDR>
```

### Description

Displays statistics for UBT.

Specifying a zone shows the UBT statistics for that zone.

Specifying a UAC IP address shows the UBT statistics for that UAC.

| Parameter | Description |
|---|---|
| `zone <ZONE-NAME>` | Specifies UBT zone name. Maximum characters: 64. |
| `uac-ip <UAC-ADDR>` | Specifies the IP address of the user anchor controller for which to view user information. Specify the address in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |

### Examples

Showing UBT statistics where local-VLAN mode has been configured:

```
switch# show ubt statistics
UBT Statistics
=====================================================================
Zone zone1:
=====================================================================
Control Plane Statistics
  Active   : 10.1.1.1
    Bootstrap Tx    :  10              Bootstrap Rx       : 10
    Nodelist Rx     :  25              Nodelist Ack Rx    : 6
    Bucketmap Rx    :  21              Bucketmap Ack Rx   : 10
    Failover Tx     :  4               Failover Ack Rx    : 3
    Unbootstrap Tx  :  7               Unbootstrap Ack Rx : 5
    Heartbeat Tx    :  5               Heartbeat Rx       : 3
  Standby  : 10.1.1.2
    Bootstrap Tx    : 10               Bootstrap Rx       : 10
    Nodelist Rx     : 25               Nodelist Ack Rx    : 6
    Bucketmap Rx   : 21                Bucketmap Ack Rx   : 12
    Failover Tx    : 4                 Failover Ack Rx    : 3
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 3
    Heartbeat Tx   : 7                 Heartbeat Rx       : 4
  UAC : 10.1.1.1
    Bootstrap Tx   : 10                Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 5
    Keepalive Tx   : 2                 Keepalive Ack Rx   : 2
  UAC : 10.1.1.2
    Bootstrap Tx   : 5                 Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 0                 Unbootstrap Ack Rx : 0
    Keepalive Tx   : 0                 Keepalive Ack Rx   : 0
Data Plane Statistics
  UAC       Packets Tx   Packets Rx
  ---------------------------------
  10.1.1.1  45678        23456
  10.1.1.2  34567        23457
User Statistics
  UAC       User Count
  -----------------------
  10.1.1.1   1
  10.1.1.2   2
=====================================================================
Zone zone2:
=====================================================================
Control Plane Statistics
  Active   : 20.1.1.3
    Bootstrap Tx   :  10               Bootstrap Rx       : 10
    Nodelist Rx    :  25               Nodelist Ack Rx    : 6
    Bucketmap Rx   :  21               Bucketmap Ack Rx   : 10
    Failover Tx    :  4                Failover Ack Rx    : 3
    Unbootstrap Tx :  7                Unbootstrap Ack Rx : 5
    Heartbeat Tx   :  5                Heartbeat Rx       : 3
  Standby  : 20.1.1.4
    Bootstrap Tx   : 10                Bootstrap Rx       : 10
    Nodelist Rx    : 25                Nodelist Ack Rx    : 6
    Bucketmap Rx   : 21                Bucketmap Ack Rx   : 12
    Failover Tx    : 4                 Failover Ack Rx    : 3
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 3
    Heartbeat Tx   : 7                 Heartbeat Rx       : 4
  UAC : 20.1.1.3
    Bootstrap Tx   : 10                Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 5
    Keepalive Tx   : 2                 Keepalive Ack Rx   : 2
  UAC : 20.1.1.4
    Bootstrap Tx   : 5                 Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 0                 Unbootstrap Ack Rx : 0
    Keepalive Tx   : 0                 Keepalive Ack Rx   : 0
Data Plane Statistics
  UAC       Packets Tx   Packets Rx
  ---------------------------------
  20.1.1.3  45670        33456
  20.1.1.4  34561        33457
User Statistics
  UAC       User Count
  -----------------------
  20.1.1.3  1
  20.1.1.4  2
```

Showing UBT statistics where VLAN-extend mode has been configured:

```
switch# show ubt statistics
UBT Statistics
======================================================================
Zone zone1:
======================================================================
Control Plane Statistics
  Active   : 10.1.1.3
    Bootstrap Tx   :  10                Bootstrap Rx       : 10
    Nodelist Rx    :  25                Nodelist Ack Rx    : 6
    Bucketmap Rx   :  21                Bucketmap Ack Rx   : 10
    Failover Tx    :  4                 Failover Ack Rx    : 3
    Unbootstrap Tx :  7                 Unbootstrap Ack Rx : 5
    Heartbeat Tx   :  5                 Heartbeat Rx       : 3
    WoL Btstrp Tx  :  1                 WoL Btstrap Ack Rx : 1
  Standby  : 10.1.1.4
    Bootstrap Tx   : 10                 Bootstrap Rx       : 10
    Nodelist Rx    : 25                 Nodelist Ack Rx    : 6
    Bucketmap Rx   : 21                 Bucketmap Ack Rx   : 12
    Failover Tx    : 4                  Failover Ack Rx    : 3
    Unbootstrap Tx : 5                  Unbootstrap Ack Rx : 3
    Heartbeat Tx   : 7                  Heartbeat Rx       : 4
    WoL Btstrp Tx  : 1                  WoL Btstrap Ack Rx : 1
  UAC : 10.1.1.3
    Bootstrap Tx   : 10                 Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 5                  Unbootstrap Ack Rx : 5
    Keepalive Tx   : 2                  Keepalive Ack Rx   : 2
  UAC : 10.1.1.4
    Bootstrap Tx   : 5                  Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 0                  Unbootstrap Ack Rx : 0
    Keepalive Tx   : 0                  Keepalive Ack Rx   : 0
Data Plane Statistics
  SAC tunnel Rx                   : 444
  Standby-SAC tunnel Rx           : 0
  UAC         Packets Tx   Packets Rx
  ---------------------------------
  10.1.1.3   45678        23456
  10.1.1.4   34567        23457
User Statistics
  UAC       User Count
  -----------------------
  10.1.1.3   1
  10.1.1.4   2
======================================================================
Zone zone2:
======================================================================
Control Plane Statistics
  Active   : 20.1.1.3
    Bootstrap Tx   :  10                Bootstrap Rx       : 10
    Nodelist Rx    :  25                Nodelist Ack Rx    : 6
    Bucketmap Rx   :  21                Bucketmap Ack Rx   : 10
    Failover Tx    :  4                 Failover Ack Rx    : 3
    Unbootstrap Tx :  7                 Unbootstrap Ack Rx : 5
    Heartbeat Tx   :  5                 Heartbeat Rx       : 3
    WoL Btstrp Tx  :  1                WoL Btstrap Ack Rx : 1
  Standby  : 20.1.1.4
    Bootstrap Tx   : 10                Bootstrap Rx       : 10
    Nodelist Rx    : 25                Nodelist Ack Rx    : 6
    Bucketmap Rx   : 21                Bucketmap Ack Rx   : 12
    Failover Tx    : 4                 Failover Ack Rx    : 3
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 3
    Heartbeat Tx   : 7                 Heartbeat Rx       : 4
    WoL Btstrp Tx  : 1                 WoL Btstrap Ack Rx : 1
  UAC : 20.1.1.3
    Bootstrap Tx   : 10                Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 5
    Keepalive Tx   : 2                 Keepalive Ack Rx   : 2
  UAC : 20.1.1.4
    Bootstrap Tx   : 5                 Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 0                 Unbootstrap Ack Rx : 0
    Keepalive Tx   : 0                 Keepalive Ack Rx   : 0
Data Plane Statistics
  SAC tunnel Rx                    : 222
  Standby-SAC tunnel Rx            : 0
  UAC       Packets Tx   Packets Rx
  ---------------------------------
  20.1.1.3  45678        23456
  20.1.1.4  34567        23457
User Statistics
  UAC       User Count
  -----------------------
  20.1.1.3   1
  20.1.1.4   2
```

Showing UBT statistics for **zone1** where local-vlan mode has been configured:

```
switch# show ubt statistics zone zone1

UBT Statistics

Zone zone1:
Control Plane Statistics

  Active    : 10.1.1.3
    Bootstrap Tx   :  10               Bootstrap Rx       : 10
    Nodelist Rx    :  25               Nodelist Ack Rx    : 6
    Bucketmap Rx   :  21               Bucketmap Ack Rx   : 10
    Failover Tx    :  4                Failover Ack Rx    : 3
    Unbootstrap Tx :  7                Unbootstrap Ack Rx : 5
    Heartbeat Tx   :  5                Heartbeat Rx       : 3

  Standby  : 10.1.1.4
    Bootstrap Tx   : 10                Bootstrap Rx       : 10
    Nodelist Rx    : 25                Nodelist Ack Rx    : 6
    Bucketmap Rx   : 21                Bucketmap Ack Rx   : 12
    Failover Tx    : 4                 Failover Ack Rx    : 3
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 3
    Heartbeat Tx   : 7                 Heartbeat Rx       : 4

  UAC : 10.1.1.3
    Bootstrap Tx   : 10                Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 5
    Keepalive Tx   : 2                 Keepalive Ack Rx   : 2
  UAC : 10.1.1.4
    Bootstrap Tx   : 5                 Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 0                 Unbootstrap Ack Rx : 0
    Keepalive Tx   : 0                 Keepalive Ack Rx   : 0

Data Plane Statistics

  UAC       Packets Tx   Packets Rx
  ---------------------------------
  10.1.1.3  45678        23456
  10.1.1.4  34567        23457

User Statistics

  UAC       User Count
  -----------------------
  10.1.1.3   1
  10.1.1.4   2
```

Showing UBT statistics for **zone1** where VLAN-extend mode has been configured:

```
switch# show ubt statistics zone zone1

UBT Statistics

Zone zone1:
Control Plane Statistics

  Active   : 10.1.1.3
    Bootstrap Tx   :  10               Bootstrap Rx       : 10
    Nodelist Rx    :  25               Nodelist Ack Rx    : 6
    Bucketmap Rx   :  21               Bucketmap Ack Rx   : 10
    Failover Tx    :  4                Failover Ack Rx    : 3
    Unbootstrap Tx :  7                Unbootstrap Ack Rx : 5
    Heartbeat Tx   :  5                Heartbeat Rx       : 3
    WoL Btstrp Tx  :  1                WoL Btstrap Ack Rx : 1

  Standby  : 10.1.1.4
    Bootstrap Tx   : 10                Bootstrap Rx       : 10
    Nodelist Rx    : 25                Nodelist Ack Rx    : 6
    Bucketmap Rx   : 21                Bucketmap Ack Rx   : 12
    Failover Tx    : 4                 Failover Ack Rx    : 3
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 3
    Heartbeat Tx   : 7                 Heartbeat Rx       : 4
    WoL Btstrp Tx  :  1                WoL Btstrap Ack Rx : 1

  UAC : 10.1.1.3
    Bootstrap Tx   : 10                Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 5                 Unbootstrap Ack Rx : 5
    Keepalive Tx   : 2                 Keepalive Ack Rx   : 2

  UAC : 10.1.1.4
    Bootstrap Tx   : 5                 Bootstrap Ack Rx   : 5
    Unbootstrap Tx : 0                 Unbootstrap Ack Rx : 0
    Keepalive Tx   : 0                 Keepalive Ack Rx   : 0

Data Plane Statistics

  SAC tunnel Rx                   : 444
  Standby-SAC tunnel Rx           : 0
  UAC        Packets Tx   Packets Rx
  ---------------------------------
  10.1.1.3   45678        23456
  10.1.1.4   34567        23457

User Statistics

  UAC       User Count
  -----------------------
  10.1.1.3   1
  10.1.1.4   2
```

Showing the UBT statistics of a UAC with IP address **101.101.101.11**:

```
switch# show ubt statistics zone zone1 uac-ip 101.101.101.11
Data Plane Statistics

  SAC tunnel Rx                     : 6457
  Standby-SAC tunnel Rx             : 0

  UAC               Packets Tx          Packets Rx
  ------------------------------------------------

  101.101.101.11  : 145379605           145450113
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show ubt users

```
show ubt users [ all | count | down | mac <MAC-ADDR> | {port <IF-NAME> | <IF-RANGE>} |
up] zone <ZONE-NAME>
```

### Description

Displays user information for UBT.

| Parameter | Description |
|---|---|
| `all` | Display information for all users. |
| `count` | Display the total number of users configured to tunnel traffic. |
| `down` | Display the users that are not able to tunnel traffic. |
| `mac <MAC-ADDR>` | Display user information based on MAC address. |
| `port <IF-NAME> \| <IF-RANGE>` | Display user information for a specific interface or range of interfaces. For example, **port 1/1/1** or **port 1/1/1-1/1/10**. |
| `up` | Display user information that are active. |
| `zone <ZONE-NAME>` | Specifies UBT zone name. Maximum characters: 64. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing information for all users:

```
switch# show ubt users all
=====================================================================
Displaying All UBT Users for Zone: zone1
=====================================================================
Downloaded user roles are preceded by *
Port    Mac Address        Tunnel Status  Secondary UserRole   Failure Reason
--------------------------------------------------------------------------
1/25    00:00:00:11:12:03  activated      authenticated         ---/---
=====================================================================
Displaying All UBT Users for Zone: zone2
=====================================================================
Downloaded user roles are preceded by *
Port    Mac Address        Tunnel Status  Secondary UserRole   Failure Reason
--------------------------------------------------------------------------
2/25    00:00:00:13:12:03  activated      authenticated         ---/---
```

Showing information for users of **zone1**:

```
switch# show ubt users all zone zone1

=====================================================================
Displaying All UBT Users for Zone: zone1
=====================================================================
Downloaded user roles are preceded by *
Port    Mac Address        Tunnel Status  Secondary UserRole   Failure Reason
--------------------------------------------------------------------------
1/25    00:00:00:11:12:03  activated      authenticated         ---/---
```

Displaying the number of users that are tunneling traffic:

```
switch# show ubt users count

Total Number of Users using ubt Zone : zone2 is 1
Total Number of Users using ubt Zone : zone1 is 2
===================================================
Total Number of Users in all the zones : 3
===================================================
```

Showing users that are down:

```
switch# show ubt users down

=====================================================================
Displaying UBT Users of Zone: zone1 having Tunnel Status DOWN
=====================================================================
Downloaded user roles are preceded by *
Port Mac Address       Tunnel Status      Secondary UserRole   Failure Reason
----------------------------------------------------------------------------------
1/25 00:00:00:11:12:03 activation_failed  authenticated        User bootstrap has
                                                               failed
```

Showing information for users of **zone1** that are down:

```
switch# show ubt users down zone zone1

=====================================================================
Displaying UBT Users of Zone: zone1 having Tunnel Status DOWN
=====================================================================
Downloaded user roles are preceded by *
Port Mac Address       Tunnel Status     Secondary UserRole   Failure Reason
--------------------------------------------------------------------------
1/25 00:00:00:11:12:03 activation_failed  authenticated       User bootstrap has
                                                              failed
```

Showing information for users on port `2/25`:

```
switch# show ubt users port 2/25

=====================================================================
Displaying UBT Users of Zone: zone1
=====================================================================
Downloaded user roles are preceded by *
Port    Mac Address        Tunnel Status  Secondary UserRole  Failure Reason
--------------------------------------------------------------------------
2/25    00:00:00:11:12:03   activated      authenticated       ---/---
```

Showing information for users that are up:

```
switch# show ubt users up

=====================================================================
Displaying UBT Users of Zone: zone1 having Tunnel Status UP
=====================================================================
Downloaded user roles are preceded by *
Port    Mac Address       Tunnel Status  Secondary UserRole  Failure Reason
--------------------------------------------------------------------------
1/25    00:00:00:11:12:03 activated      authenticated       ---/---
```

Showing information for users of `zone1` that are up:

```
switch# show ubt users up zone zone1

=====================================================================
Displaying UBT Users of Zone: zone1 having Tunnel Status UP
=====================================================================
Downloaded user roles are preceded by *
Port    Mac Address       Tunnel Status  Secondary UserRole  Failure Reason
--------------------------------------------------------------------------
1/25    00:00:00:11:12:03 activated      authenticated       ---/---
```

Showing information for the user with MAC address `00:00:00:11:12:03`:

```
switch# show ubt users mac 00:00:00:11:12:03

Displaying UBT User of Zone: zone1 having MAC-Address: 00:00:00:11:12:03
Downloaded user roles are preceded by *
Port    Mac Address       Tunnel Status  Secondary UserRole  Failure Reason
--------------------------------------------------------------------------
1/25    00:00:00:11:12:03 activated      authenticated       ---/---
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## uac-keepalive-interval

```
uac-keepalive-interval <TIME>
no uac-keepalive-interval <TIME>
```

### Description

Specifies the UAC keep alive refresh time interval in seconds for the UBT zone.

The **no** form of this command sets the keep alive interval to the default value.

| Parameter | Description |
|---|---|
| *<TIME>* | Specifies the UAC keep-alive refresh time interval in seconds. Range: 1 to 60. Default: 60. |

### Examples

Specifying a keepalive interval of 60 seconds for UBT **zone1**:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# uac-keepalive-interval 60
```

Deleting the configured UAC keepalive interval:

```
switch(config)# ubt zone zone1
switch(config-ubt-zone1)# no uac-keepalive-interval 60
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-ubt-<ZONE-NAME>` | Administrators or local user group members with execution rights for this command. |

## ubt

```
ubt zone <ZONE-NAME> vrf <VRF-NAME>
no ubt zone <ZONE-NAME> vrf <VRF-NAME>
```

### Description

Creates a User Based Tunnel (UBT) zone with a specified zone name and VRF name. A UBT name is used to configure all UBT properties advertised by the UBT feature.

The **no** form of this command removes the specified UBT zone.

This configuration will disable flow tracking statistics collection.

| Parameter | Description |
|---|---|
| *<ZONE-NAME>* | Specifies a name for the UBT zone. Length: 1 to 64 characters. |
| *<VRF-NAME>* | Specifies the VRF on which to establish the UBT tunnel. |

### Examples

Creating UBT zone called **zone1** associated with a VRF called **default**:

```
switch(config)# ubt zone zone1 vrf default
```

Removing UBT zone **zone1** on VRF **default**:

```
switch(config)# no ubt zone zone1 vrf default
```

Deleting all UBT configurations:

```
switch(config)# no ubt
```

Warning message is displayed when this configuration is enabled:

```
switch(config)# ubt zone my-zone vrf my-vrf
Warning: This configuration will disable flow tracking statistics collection.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Added information related to role based IPFIX. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## ubt-client-vlan

```
ubt-client-vlan <VLAN-ID>
no ubt-client-vlan <VLAN-ID>
```

### Description

Specifies the UBT Client VLAN or local VLAN. This VLAN is used in local-VLAN mode only. If the UBT client VLAN is configured in VLAN-extend mode it is ignored, this is the reserved VLAN that all client traffic uses to get to the gateway. At the gateway, VLAN and policy will be assigned to the client traffic. No other feature should be enabled on the UBT client VLAN.

The **no** form of this command removes the VLAN to use for tunneled clients.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies the VLAN ID to use for tunneled clients. Range: 1-4094. |

## Examples

Creating VLAN 4000:

```
switch(config)# vlan 4000
switch(config-vlan-4000)# no shutdown
```

Specifying UBT client VLAN 4000:

```
switch(config)# ubt-client-vlan 4000
```

Setting multi-zone:

```
switch(config)# ubt-client-vlan 4000
switch(config)# ubt zone zone8 vrf default
switch(config-ubt-zone8)# primary-controller ip 20.20.20.13
switch(config-ubt-zone8)# enable
switch(config)# ubt zone zone5 vrf default
switch(config-ubt-zone5)# primary-controller ip 20.20.20.10
switch(config-ubt-zone5)# enable
switch(config)# ubt zone zone3 vrf default
switch(config-ubt-zone3)# primary-controller ip 10.10.10.248
switch(config-ubt-zone3)# enable
switch(config)# ubt zone zone2 vrf default
switch(config-ubt-zone2)# primary-controller ip 162.10.0.6
switch(config-ubt-zone2)# enable
switch(config)# ubt zone zone7 vrf default
switch(config-ubt-zone7)# primary-controller ip 20.20.20.12
switch(config-ubt-zone7)# enable
switch(config)# ubt zone zone4 vrf default
switch(config-ubt-zone4)# primary-controller ip 10.10.10.251
switch(config-ubt-zone4)# enable
ip source-interface ubt interface loopback200
```

Removing configured UBT client VLAN 4000:

```
switch(config)# no ubt-client-vlan 4000
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## ubt mode vlan-extend

```
ubt-mode vlan-extend
no ubt-mode [vlan-extend]
```

### Description

Selects VLAN extended mode. When VLAN-extend mode is enabled clients are assigned to their UBT role-based VLAN in the hardware datapath.

The **no** form of the command selects the default local-VLAN mode. In local-VLAN mode clients are assigned to a local switch VLAN and associated with their UBT role-based VLAN when client traffic reaches the controller.

The default UBT mode is local-VLAN.

### Examples

Setting the UBT mode to VLAN-extend:

```
switch(config)# ubt-mode vlan-extend
```

Setting multi-zone:

```
switch(config)# ubt-mode vlan-extend
switch(config)# ubt zone zone8 vrf default
switch(config-ubt-zone8)# primary-controller ip 20.20.20.13
switch(config-ubt-zone8)# enable
switch(config)# ubt zone zone5 vrf default
switch(config-ubt-zone5)# primary-controller ip 20.20.20.10
switch(config-ubt-zone5)# enable
switch(config)# ubt zone zone3 vrf default
switch(config-ubt-zone3)# primary-controller ip 10.10.10.248
switch(config-ubt-zone3)# enable
switch(config)# ubt zone zone2 vrf default
switch(config-ubt-zone2)# primary-controller ip 162.10.0.6
switch(config-ubt-zone2)# enable
switch(config)# ubt zone zone7 vrf default
switch(config-ubt-zone7)# primary-controller ip 20.20.20.12
switch(config-ubt-zone7)# enable
switch(config)# ubt zone zone4 vrf default
switch(config-ubt-zone4)# primary-controller ip 10.10.10.251
switch(config-ubt-zone4)# enable
ip source-interface ubt interface loopback200
```

Setting the UBT mode back to the default of local-VLAN:

```
switch(config)# no ubt-mode
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Added multi-zone support. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## wol-enable vlan

```
wol-enable vlan <VLANID>
no wol-enable vlan <VLANID>
```

### Description

Configures Wake-on-LAN VLANs in the ubt <zone-name> context. The maximum number of VLANs that can be configured per UBT zone is 100. VLANs must be pre-configured on the switch and controller.

The **no** form of this command removes the specified configuration.

This command is applicable for UBT vlan-extend mode only.

The Wake-on-LAN VLAN / Silent client device support feature is supported only on Aruba Mobility Controller (AOS) v8.10 and above.

Wake-on-LAN enabled VLANs should not be configured on Layer-2 trunked uplink ports to avoid network loops.

Wake-on-LAN configuration should not be modified when active UBT users are present.

| Parameter | Description |
|---|---|
| *<VLANID>* | Specifies the VLANs. |

### Examples

Configure wake-on-LAN VLANs in a UBT zone called **my-zone** associated with a VRF called **red**:

```
switch(config)# ubt zone my-zone vrf red
switch(config-ubt-my-zone)# wol-enable vlan 10-20
```

Delete wake-on-LAN VLANs in a UBT zone called **my-zone** associated with a VRF called **red**:

```
switch(config)# ubt zone my-zone vrf red
switch(config-ubt-my-zone)# no wol-enable vlan 10-20
```

Removing wake-on-LAN VLANs in a UBT zone called **my-zone**:

```
switch(config)# ubt zone my-zone
switch(config-ubt-my-zone)# no wol-enable
```

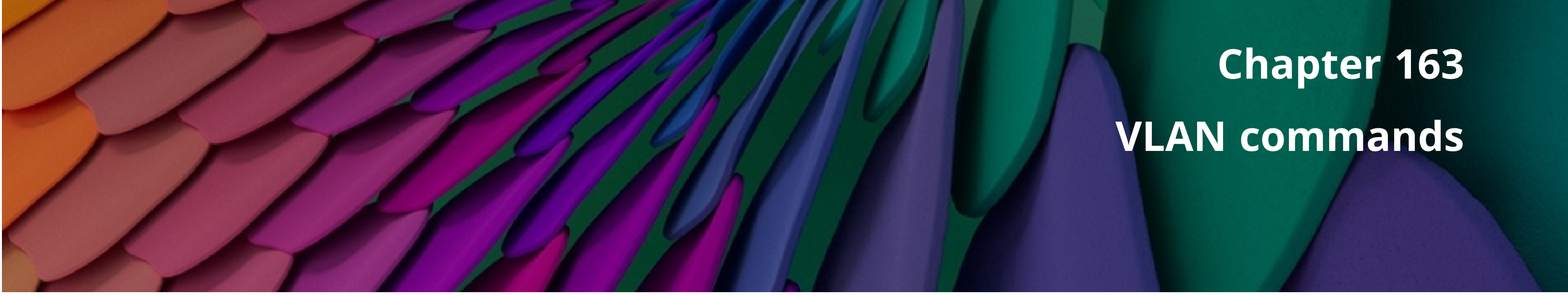
For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |



# Chapter 163
# VLAN commands

## description

`description <DESCRIPTION>`

### Description

Specifies a descriptive for a VLAN.

| Parameter | Description |
|---|---|
| *<DESCRIPTION>* | Specifies a description for the VLAN. |

### Examples

Assigning a description to VLAN **20**:

```
switch(config)# vlan 20
switch(config-vlan-20)# description primary
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-vlan-<VLAN-ID>` | Administrators or local user group members with execution rights for this command. |

## vlan name

`name <VLAN-NAME>`

### Description

Associates a name with a VLAN.

| Parameter | Description |
|---|---|
| *<VLAN-NAME>* | Specifies a name for a VLAN. Length: 1 to 32 alphanumeric characters, including underscore (_) and hyphen (-). |

### Usage

- Each named VLAN must have a unique name; there cannot be duplicate names for VLANs.
- By default, VLANs are created with the default name: VLAN *<VLAN-ID>*

### Examples

Assigning the name **backup** to VLAN **20**:

```
switch(config)# vlan 20
switch(config-vlan-20)# name backup
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-vlan-<VLAN-ID>` | Administrators or local user group members with execution rights for this command. |

## show capacities-status vlan-count

```
show capacities-status vlan-count
```

### Description

Shows the number of VLANs present on the switch and the maximum number of VLANs allowed on the switch.

### Example

Showing switch VLAN capacity status:

```
show capswitch# show capacities-status vlan-count
System Capacities: Filter VLAN count
Capacities Name                                         Value    Maximum
-------------------------------------------------------------------------
Maximum number of VLANs currently configured             1        xxxx
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show capacities svi-count

`show capacities svi-count`

### Description

Shows the maximum number of SVIs supported by the switch.

### Examples

Showing switch SVI capacity:

```
switch# show capacities svi-count
System Capacities: Filter SVI count
Capacities Name                                                   Value
---------------------------------------------------------------------
Maximum number of SVIs supported in the system                    128
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show capacities vlan-count

`show capacities vlan-count`

## Description

Shows the maximum number of VLANs allowed on the switch.

## Example

Showing switch VLAN capacity:

```
show capswitch# show capacities vlan-count
System Capacities: Filter VLAN count
Capacities Name                                                   Value
------------------------------------------------------------------------
Maximum number of VLANs supported in the system                    4094
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |

# show capacities-status vlan-translation

`show capacities-status vlan-translation`

## Description

Shows the number of VLAN translation rules present on the switch and the maximum number of VLAN translation rules allowed on the switch. The maximum number of VLAN translation rules allowed are 4000.

## Example

Showing switch VLAN translation rules capacity:

```
switch(config-vlan-100)# show capacities vlan-translation
System Capacities: Filter VLAN Translation
Capacities Name                                                 Value
------------------------------------------------------------------------
Maximum number of VLAN Translation rules supported               4000
```

```
switch(config-vlan-100)#
switch(config-vlan-100)#
switch(config-vlan-100)#
switch(config-vlan-100)#
switch(config-vlan-100)# show capacities-st vlan-translation

System Capacities Status: Filter VLAN Translation
Capacities Status Name                                     Value Maximum
--------------------------------------------------------------------------
Number of VLAN Translation rules currently configured         1   4000
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show vlan

`show vlan [<VLAN-ID>] [vsx-peer]`

### Description

Displays configuration information for all VLANs or a specific VLAN.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies a VLAN ID. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Displaying configuration information for VLAN **2**:

```
switch# show vlan 2
----------------------------------------------------------------------------------
```

```
VLAN  Name                     Status  Reason          Type      Interfaces
----------------------------------------------------------------------------------
2     UserVLAN1                up      ok              static    1/1/1,1/1/3,1/1/5
```

Displaying configuration information for all defined VLANs:

```
switch# show vlan
----------------------------------------------------------------------------------
VLAN  Name                 Status  Reason        Type      Interfaces
----------------------------------------------------------------------------------
-
1     DEFAULT_VLAN_1       up      ok            static    1/1/3-1/1/4
2     UserVLAN1            up      ok            static    1/1/1,1/1/3,1/1/5
3     UserVLAN2            up      ok            static    1/1/2-1/1/3,1/1/5-1/1/6
5     UserVLAN3            up      ok            static    1/1/3
10    TestNetwork          up      ok            static    1/1/3,1/1/5
11    VLAN11               up      ok            static    1/1/3
12    VLAN12               up      ok            static    1/1/3,1/1/6,lag1-lag2
13    VLAN13               up      ok            static    1/1/3,1/1/6
14    VLAN14               up      ok            static    1/1/3,1/1/6
20    ManagementVLAN       down    admin_down    static    1/1/3,1/1/10
```

Displaying configuration information for auto-vlan:

```
switch# show vlan
----------------------------------------------------------------------------------
VLAN  Name        Status  Reason        Type        Interfaces
----------------------------------------------------------------------------------
--------------------------------
23    VLAN23       up       ok        port-access    1/1/1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vlan port

`show vlan port <INTERFACE-ID> [vsx-peer]`

## Description

Displays the VLANs configured for a specific layer 2 interface.

| Parameter | Description |
|---|---|
| *<INTERFACE-ID>* | Specifies an interface ID. Format: **member/slot/port**. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Displaying the VLANs configured on interface **1/1/1**:

```
switch# show vlan port 1/1/1
--------------------------------------------------------------------------------
VLAN  Name                            Mode            Mapping
--------------------------------------------------------------------------------
2     UserVLAN1                       access          port
3     UserVLAN2                       access          arp,ipv4
5     UserVLAN5                       access          ipv6
```

Displaying RADIUS server provided VLAN 2,3,5 as extended access VLANs (MBV):

```
switch# show vlan port 1/1/1
--------------------------------------------------------------------------------
VLAN  Name                            Mode            Mapping
--------------------------------------------------------------------------------
2     UserVLAN1                       access          mbv, port
3     UserVLAN2                       access          mbv
5     UserVLAN5                       access          mbv

Overriden VLAN list: 2-3,5
```

Displaying RADIUS server provided VLAN 50 as access VLAN and mode as access:

```
switch# show vlan port 1/1/1
--------------------------------------------------------------------------------
VLAN  Name                            Mode            Mapping
--------------------------------------------------------------------------------
50    VLAN50                          access          port-access

Overridden VLAN list: 2-3,5
```

Displaying RADIUS server provided VLAN 50 as access VLAN and mode as access, and 2,3 as extended access VLANs (MBV):

```
switch# show vlan port 1/1/1
--------------------------------------------------------------------------------
VLAN  Name                            Mode            Mapping
--------------------------------------------------------------------------------
```

```
2     UserVLAN1                       access          mbv
3     UserVLAN2                       access          mbv
50    VLAN50                          access          port-access

Overridden VLAN list: 2-3,5
```

Displaying RADIUS server provided mode as native-untagged, 11-14 as trunk VLANs, VLAN 11 as an access VLAN and VLAN 2, 3 as extended access VLANs (MBV):

```
switch# show vlan port 1/1/1
--------------------------------------------------------------------------------
VLAN  Name                            Mode            Mapping
--------------------------------------------------------------------------------
2     UserVLAN1                       access          mbv
3     UserVLAN2                       access          mbv
11    VLAN11                          native-untagged port-access
12    VLAN12                          trunk           port-access
13    VLAN13                          trunk           port-access
14    VLAN14                          trunk           port-access

Overridden VLAN list: 2-3,5
```

Displaying RADIUS server provided mode as native-tagged, 11-14 as trunk VLANs, VLAN 11 as an access VLAN and VLAN 2, 3 as extended access VLANs (MBV):

```
switch# show vlan port 1/1/1
--------------------------------------------------------------------------------
VLAN  Name                            Mode            Mapping
--------------------------------------------------------------------------------
2     UserVLAN1                       native-untagged mbv, port
3     UserVLAN2                       access          mbv
11    VLAN11                          trunk           port-access
12    VLAN12                          trunk           port-access
13    VLAN13                          trunk           port-access
14    VLAN14                          trunk           port-access

Overridden VLAN list: 3,5
```

Displaying RADIUS server provided mode as native-tagged, 3, 11-14 as trunk VLANs, VLAN 11 as an access VLAN and VLAN 2, 3 as extended access VLANs (MBV):

```
switch# show vlan port 1/1/1
--------------------------------------------------------------------------------
VLAN  Name                            Mode            Mapping
--------------------------------------------------------------------------------
2     UserVLAN1                       native-untagged mbv, port
3     UserVLAN2                       native-untagged port-access, mbv
11    VLAN11                          trunk           port-access
12    VLAN12                          trunk           port-access
13    VLAN13                          trunk           port-access
14    VLAN14                          trunk           port-access

Overridden VLAN list: 3,5
```

Displaying RADIUS server provided mode as native-tagged, 2, 11-14 as trunk VLANs, VLAN 11 as an access VLAN:

```
switch# show vlan port 1/1/1
-------------------------------------------------------------------------------
VLAN  Name                                Mode            Mapping
-------------------------------------------------------------------------------
2     UserVLAN1                           trunk           port-access
11    VLAN11                              native-tagged   port-access
12    VLAN12                              trunk           port-access
13    VLAN13                              trunk           port-access
14    VLAN14                              trunk           port-access

Overridden VLAN list: 2-3,5
```

Displaying the VLANs configured on interface **1/1/3**:

```
switch# show vlan port 1/1/3
-------------------------------------------------------------------------------
VLAN  Name                                Mode            Mapping
-------------------------------------------------------------------------------
1     DEFAULT_VLAN_1                      native-untagged port
2     UserVLAN1                           trunk           port
3     UserVLAN2                           trunk           port
5     UserVLAN3                           trunk           port
10    TestNetwork                         trunk           port
11    VLAN11                              trunk           port
12    VLAN12                              trunk           port
13    VLAN13                              trunk           port
14    VLAN14                              trunk           port
20    ManagementVLAN                      trunk           port
30    VLAN30                              trunk           port
40    VLAN40                              trunk           port
50    VLAN50                              trunk           port
100   VLAN100                             trunk           port
200   VLAN200                             trunk           port
```

Displaying RADIUS server provided VLANs 2,11-14 as trunk VLANs, VLAN 2 as an access VLAN, and mode as native-untagged:

```
switch# show vlan port 1/1/3
-------------------------------------------------------------------------------
VLAN  Name                                Mode            Mapping
-------------------------------------------------------------------------------
2     UserVLAN1                           native-untagged port-access
11    VLAN11                              trunk           port-access
12    VLAN12                              trunk           port-access
13    VLAN13                              trunk           port-access
14    VLAN14                              trunk           port-access

Overridden VLAN list: 1-3,5,10-14,20,30,40,50,100,200
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vlan summary

```
show vlan summary [vsx-peer]
```

### Description

Displays a summary of the VLAN configuration on the switch.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Displaying a summary of the VLAN configuration on the switch:

```
switch# show vlan summary
Number of existing VLANs: 11
Number of static VLANs:   11
Number of dynamic VLANs:  0
Number of port-access VLANs: 1
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vlan translation

`show vlan translation [interface <INTERFACE-NAME>] [vsx-peer]`

### Description

Shows a summary of all VLAN translations rules defined on the switch, or the rules defined for a specific interface.

| Parameter | Description |
|---|---|
| `interface <INTERFACE-NAME>` | Specifies the name of a layer 2 interface. Format: **member/slot/port**. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Displaying a summary of all VLAN translations rules defined on the switch:

```
switch# show vlan translation
--------------------------------------------
Interface  VLAN-1      VLAN-2
--------------------------------------------
1/1/5      10          20
1/1/5      30          40
1/1/5      50          100
1/1/6      100         200

Total number of translation rules : 4
```

Displaying a summary of all VLAN translations rules defined on interface **1/1/5**:

```
switch# show vlan translation interface 1/1/5
--------------------------------------------
Interface  VLAN-1      VLAN-2
--------------------------------------------
1/1/5      10          20
1/1/5      30          40
1/1/5      50          100
```

Displaying VLAN translation information when VSX peer is configured:

```
switch(config-if)# show vlan translation vsx-peer
--------------------------
Interface VLAN-1  VLAN-2
--------------------------
1/3/1     10      20
Total number of translation rules : 1
```

Displaying VLAN translation information when VSX peer is not configured:

```
switch(config-if)# show vlan translation vsx-peer
VSX is not configured
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vlan translation pending

`show vlan translation pending`

### Description

Shows a list of pending VLAN translation rules.

### Examples

Displaying a list of VLAN translations rules pending on the switch:

```
switch# show vlan translation pending
-------------------------------------------
Interface  VLAN-1      VLAN-2
-------------------------------------------
1/1/5      10          20
1/1/5      30          40
1/1/5      50          100
1/1/6      100         200

Total number of VLAN translation rules that are pending: 4
```

Displaying the output when there are no VLAN translation rules in the pending list:

```
switch# show vlan translation interface 1/1/5
No pending VLAN translation rules
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vlan voice

`show vlan voice`

### Description

Displays the voice VLAN list showing the VLAN ID, name, operational state of the VLAN, and the interfaces associated with the VLAN.

### Example

Displaying the voice VLANs list :

```
switch# show vlan voice
----------------------------------------------------------------------------------
------------
VLAN  Name                              Status                Type      Interfaces
----------------------------------------------------------------------------------
------------
10    TestNetwork                       up                    static
1/1/3,1/1/5
```

Displaying the information when voice VLANs are not configured:

```
switch# show vlan voice
Voice VLAN not configured
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## shutdown

```
shutdown
no shutdown
```

### Description

Disables a VLAN. (By default, a VLAN is automatically enabled when it is created with the **vlan** command.)

The **no** form of this command enables a VLAN.

### Examples

Enabling VLAN 20:

```
switch(config)# vlan 20
switch(config-vlan-20)# no shutdown
```

Disabling VLAN 20:

```
switch(config)# vlan 20
switch(config-vlan-20)# shutdown
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-vlan-<VLAN-ID>` | Administrators or local user group members with execution rights for this command. |

# system vlan-client-presence-detect

```
system vlan-client-presence-detect
no system vlan-client-presence-detect
```

### Description

Enables VNI mapped VLANs when detecting the presence of a client. When enabled, VNI mapped VLANs are *up* only if there are authenticated clients on the VLAN, or if the VLAN has statically configured ports and those ports are *up*. When not enabled, VNI mapped VLANs are always *up*.

The **no** form of this command disables detection of clients on VNI mapped VLANs.

### Examples

Enabling detection of clients:

```
switch(config)# system vlan-client-presence-detect
```

Disabling detection of clients:

```
switch(config)# no system vlan-client-presence-detect
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# trunk-dynamic-vlan-include

```
trunk-dynamic-vlan-include
no trunk-dynamic-vlan-include
```

### Description

Indicates if dynamically learned VLANs from MVRP and port-access should be included or excluded on ports configured with **vlan trunk allowed all**. By default, dynamic VLANs are not included in the trunk allowed list. This command is used at the system-level.

The **no** form of this command disables the inclusion of dynamic VLANs in the VLANs table. This is the default.

### Examples

Including the dynamic VLANs in the VLAN table:

```
switch(config)# trunk-dynamic-vlan-include
```

Disabling the inclusion of dynamic VLANs in the VLAN table (default):

```
switch(config)# no trunk-dynamic-vlan-include
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

## uufb

```
uufb
no uufb
```

### Description

Enables the Unknown Unicast Flood Block (UUFB) feature on a physical interface. When this feature is enabled on a physical interface, unknown unicast packets are blocked from egressing the physical interface. This feature is disabled by default.

UUFB can be enabled only on the physical interface.

UUFB cannot be enabled on:

- Routed interface
- LAGs
- VSX inter-switch link
- Interface used as an ISL

## Examples

Enabling UUFB on an L2 access port:

```
switch(config)# interface 1/1/1
switch(config-if)# vlan access 1
switch(config-if)# uufb
```

Enable UUFB on an L2 trunk port:

```
switch(config)# interface 1/1/1
switch(config-if)# vlan trunk allowed all
switch(config-if)# uufb
```

Disabling UUFB on an L2 access or trunk port:

```
switch(config-if)# no uufb
```

## Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

# vlan

```
vlan <VLAN-LIST>
no vlan <VLAN-LIST>
```

## Description

Creates a VLAN and changes to the **config-vlan-id** context for the VLAN. By default, the VLAN is enabled. To disable a VLAN, use the **shutdown** command.

If the specified VLAN exists, this command changes to the **config-vlan-id** context for the VLAN. If a range of VLANs is specified, the context does not change.

> VLANs used for internal purposes using the command **system internal vlan range** cannot be used for any other (L2) purposes.

The **no** form of this command removes a VLAN. VLAN 1 is the default VLAN and cannot be deleted.

| Parameter | Description |
|---|---|
| *<VLAN-LIST>* | Specifies a single ID, or a series of IDs separated by commas (2, 3, 4), dashes (2-4), or both (2-4,6). Range: 1 to 4094. |

## Examples

Creating VLAN **20**:

```
switch(config)# vlan 20
switch(config-vlan-20)#
```

Removing VLAN **20**:

```
switch(config)# no vlan 20
```

Creating VLANs **2** to **8** and **10**:

```
switch(config)# vlan 2-8,10
```

Removing VLANs **2** to **8** and **10**:

```
switch(config)# no vlan 2-8,10
```

Creating a VLAN which is already configured as an internal VLAN:

```
switch(config)# vlan 3001
Ignoring the operation on internal VLAN(s) 3001.
```

Deleting an unconfigured VLAN which is already configured as internal VLAN:

```
switch(config)# no vlan 300
Ignoring the operation for non-configured VLAN(s) 300.
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config` | Administrators or local user group members with execution rights for this command. |

# vlan access

```
vlan access <VLAN-ID>
no vlan access [<VLAN-ID>]
```

## Description

Creates an access interface and assigns an VLAN ID to it. Only one VLAN ID can be assigned to each access interface.

VLANs can only be assigned to non-routed (Layer 2) interfaces. All interfaces are non-routed (Layer 2) by default when created. Use **routing** and **no routing** commands to move ports between Layer 3 and Layer 2 interfaces.

The **no** form of this command removes an access VLAN from the interface in the current context and sets it to the default VLAN ID of 1.

## Command context

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies a single ID, or a series of IDs separated by commas (2, 3, 4), dashes (2-4), or both (2-4,6). Range: 1 to 4094. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring interface **1/1/2** as an access interface with VLAN ID set to **20**:

```
switch(config)# interface 1/1/2
switch(config-if)# vlan access 20
```

Removing VLAN ID **20** from interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan access 20
```

or:

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan access
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## vlan protocol

```
vlan protocol <PROTOCOL_NAME> <VLAN-ID>
no vlan protocol <PROTOCOL_NAME> <VLAN-ID>
```

### Description

Adds protocol mapping to a VLAN on an interface.

The **no** form of this command removes protocol mapping from the VLAN on an interface.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies a VLAN ID. Range: 2 to 4094. |
| *<PROTOCOL_NAME>* | Specifies the protocol that the VLAN is bound to for a given interface. Options are: **appletalk**, **arp**, **ip**, **ipv6**, **ipx**, **netbui**, and **sna**. |

### Usage

- This command is only applicable to access ports.
- Protocol VLAN should be different from access VLANs.
- VLAN should be configured on the switch.
- Routing must be disabled on the interface.
- Interface must be a physical or LAG interface.
- The same protocol-mapped VLAN is recommended for ARP and IPv4 protocols to avoid IPv4 traffic loss.

### Examples

Assigning a protocol mapping to a VLAN on an interface:

```
switch(config)# interface 1/1/2
switch(config-if)# vlan protocol ip 10
```

Assigning a protocol mapping to a VLAN on a LAG interface:

```
switch(config)# interface lag 2
switch(config-lag-if)# vlan protocol ipv6 10
```

Removing a protocol mapping from a VLAN on an interface:

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan protocol ipv6 10
```

Removing a protocol mapping from a VLAN on a LAG interface:

```
switch(config)# interface lag 2
switch(config-lag-if)# no vlan protocol ipv6 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if`<br>`config-lag-if` | Administrators or local user group members with execution rights for this command. |

## vlan translate

```
vlan translate <VLAN-1> <VLAN-2>
no vlan translate <VLAN-1> <VLAN-2>
```

### Description

Defines a bidirectional VLAN translation rule that maps an original VLAN ID (VLAN-1) to a translated internal VLAN ID (VLAN-2) on a LAG or layer 2 interface. Applies to both incoming and outgoing traffic.

On the Aruba 6300, 6400 Switch Series: Traffic for translated VLANs and native VLAN is allowed, and VLANs which are part of the VLAN trunk allowed list are blocked.

The **no** form of this command removes an existing VLAN translation rule on the current interface.

VLAN translation and MVRP cannot be enabled on the same interface.

A port with a VLAN translation configuration allows traffic only for the translated VLAN and the native VLAN; if it is a member of more VLANS, it does not allow traffic for them.

A translated VLAN must be present on the switch before the rule is created; the original VLAN need not be present.

| Parameter | Description |
|---|---|
| *<VLAN-1>* | Specifies the number of an origin VLAN. Range: 1 - 4000. |
| *<VLAN-2>* | Specifies the number of a translated VLAN. Range: 1 - 4000. |

## Usage

- This configuration can be applied only on layer 2 trunk ports.
- Routing must be disabled on the interface.
- Interface must be a layer 2 physical or LAG interface.
- This configuration is supported only on 24 ports.
- Maximum unique VLAN translation rules supported on the Aruba 6300, 6400 Switch Series—4000
- For a given port, VLAN translation cannot be applied if there are any Private-VLAN (PVLAN) configuration(s) on the switch (applies to Aruba 6300 and 6400 Switch Series). VLAN translation and PVLANs are mutually exclusive features.

## Examples

Translates origin VLAN **200** to translated VLAN **20** on interface **1/1/2**.

```
switch# config
switch(config)# vlan 20
switch(config-vlan-20)# exit
switch(config)# interface 1/1/2
switch(config-if)# no routing
switch(config-if)# vlan trunk allowed 20
switch(config-if)# vlan translate 200 20
```

Translates origin VLANs **100** and **300** to translated VLANs **10** and **20** on interface **1/1/2**.

```
switch# config
switch(config)# vlan 10,30
switch(config-vlan-20)# exit
switch(config)# interface 1/1/2
switch(config-if)# no routing
switch(config-if)# vlan trunk allowed 10,30
switch(config-if)# vlan translate 100 10
switch(config-if)# vlan translate 300 30
```

Though VLAN translation is not supported on Native VLAN configurations, a translation rule will be created to ensure VLAN translation works when the native VLAN is updated. These rules appear in the output of the **show running-config** command, though they are not operational.

```
(config)# interface 1/1/4
switch (config-if)# vlan translate 10 2
Warning: Operation not allowed on native VLAN 1
switch(config-if)# show runing-config current-context
interface 1/1/1
no shutdown
no routing
```

```
vlan trunk native 1
vlan trunk allowed all
vlan translate 1 2 <<< non-functional translation rules
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if` | Administrators or local user group members with execution rights for this command. |

## vlan trunk allowed

```
vlan trunk allowed [<VLAN-LIST> | all]
no vlan trunk allowed [<VLAN-LIST>]
```

### Description

Assigns a VLAN ID to an trunk interface. Multiple VLAN IDs can be assigned to a trunk interface. These VLAN IDs define which VLAN traffic is allowed across the trunk interface.

VLANs can only be assigned to non-routed (Layer 2) interfaces. All interfaces are non-routed (Layer 2) by default when created. Use **routing** and **no routing** commands to move ports between Layer 3 and Layer 2 interfaces.

The **no** form of this command removes one or more VLAN IDs from a trunk interface. When the last VLAN is removed from a trunk interface, the interface continues to operate in trunk mode, and will trunk all the VLANs currently defined on the switch, and any new VLANs defined in the future. To disable the trunk interface, use the command shutdown.

| Parameter | Description |
|---|---|
| *<VLAN-LIST>* | Specifies a single ID, or a series of IDs separated by commas (2, 3, 4), dashes (2-4), or both (2-4,6). Range: 1 to 4094. |
| `all` | Configures the trunk interface to allow all the VLANs currently configured on the switch and any new VLANs that are configured in the future. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Assigning VLANs **2**, **3**, and **4** to trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# vlan trunk allowed 2,3,4
```

Assigning VLAN IDs **2** to **8** to trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# vlan trunk allowed 2-8
```

Assigning VLAN IDs **2** to **8** and 10 to trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# vlan trunk allowed 2-8,10
```

Removing VLAN IDs **2**, **3**, and **4** from trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan trunk allowed 2,3,4
```

Removing all VLANs assigned to trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan trunk allowed 2
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## vlan trunk native

```
vlan trunk native <VLAN-ID>
no vlan trunk native [<VLAN-ID>]
```

### Description

Assigns a native VLAN ID to a trunk interface. By default, VLAN ID 1 is assigned as the native VLAN ID for all trunk interfaces. VLANs can only be assigned to a non-routed (layer 2) interface or LAG interface. Only one VLAN ID can be assigned as the native VLAN.

When a native VLAN is defined, the switch automatically executes the **vlan trunk allowed all** command to ensure that the default VLAN is allowed on the trunk. To only allow specific VLANs on the trunk, issue the **vlan trunk allowed** command specifying only specific VLANs.

The **no** form of this command removes a native VLAN from a trunk interface and assigns VLAN ID 1 as its native VLAN.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies a VLAN ID. Range: 1 to 4094. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Assigning native VLAN ID **20** to trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# vlan trunk native 20
```

Removing native VLAN **20** from trunk interface **1/1/2** and returning to the default VLAN 1 as the native VLAN.

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan trunk native 20
```

or:

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan trunk native
```

Assigning native VLAN ID **20** to trunk interface **1/1/2** and then removing it from the list of allowed VLANs. (Only allow VLAN 10 on the trunk.)

```
switch(config)# interface 1/1/2
switch(config-if)# vlan trunk native 20
switch(config-if)# vlan trunk allowed 10
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## vlan trunk native tag

```
vlan trunk native <VLAN-ID> tag
no vlan trunk native <VLAN-ID> tag
```

### Description

Enables tagging on a native VLAN. Only incoming packets that are tagged with the matching VLAN ID are accepted. Incoming packets that are untagged are dropped except for BPDUs. Egress packets are tagged.

The **no** form of this command removes tagging on a native VLAN.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies the number of a VLAN. Range: 1 to 4094. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling tagging on native VLAN **20** on trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# vlan trunk native 20
switch(config-if)# vlan trunk native 20 tag
```

Removing tagging on native VLAN **20** assigned to trunk interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# no vlan trunk native 20 tag
```

Enabling tagging on native VLAN **20** assigned to LAG trunk interface **2**:

```
switch(config)# interface lag 2
switch(config-lag-if)# vlan trunk native 20
switch(config-lag-if)# vlan trunk native 20 tag
```

For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-if` | Administrators or local user group members with execution rights for this command. |

## voice

```
voice
no voice
```

### Description

Configures a VLAN as a voice VLAN.

The **no** form of this command removes voice configuration from a VLAN.

### Examples

Configuring VLAN 10 as a voice VLAN:

```
switch(config)# vlan 10
switch(config-vlan-10)# voice
```

Removing voice from VLAN 10:

```
switch(config-vlan-10)# no voice
```

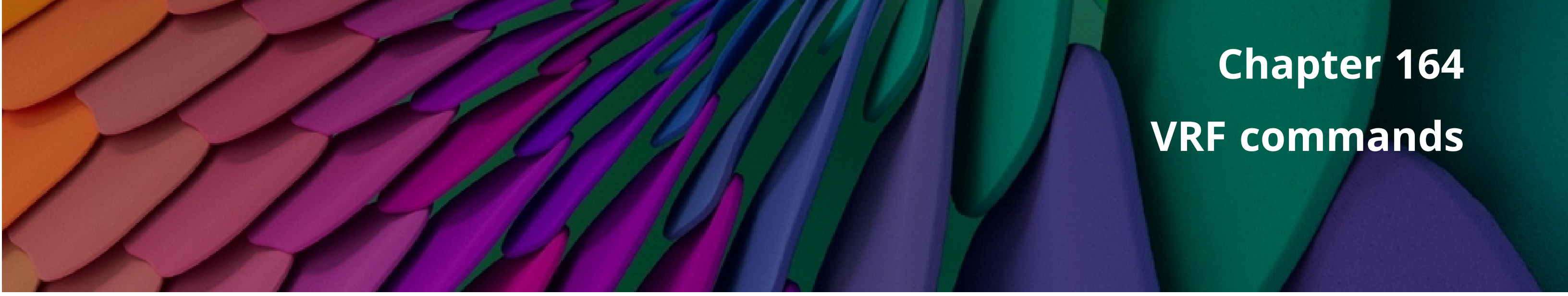
For more information on features that use this command, refer to the Layer 2 Bridging Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | `config-vlan-<VLAN-ID>` | Administrators or local user group members with execution rights for this command. |



# Chapter 164

# VRF commands

## ip route vrf

```
ip route <DEST-IPV4-ADDR>/<MASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
   vrf <VRF-NAME>
no ip route <DEST-IPV4-ADDR>/<MASK> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
   vrf <VRF-NAME>
```

### Description

Adds the destination IPv4 static route on the specified VRF. If no *<VRF-NAME>* is specified the route is applied to the default VRF.

The **no** form of this command removes the IPv4 static route from the VRF.

| Parameter | Description |
|---|---|
| *<DEST-IPV6-ADDR>* | Specifies the route destination in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<MASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXT-HOP-IP-ADDR>* | Specifies the next hop in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |
| *<INTERFACE>* | Specifies the next hop as an outgoing interface. |
| `nullroute` | Silently discards packets to the destined route. |
| `reject` | Discards packets to the destined route and returns an ICMP error to the sender. |
| `vrf` *<VRF-NAME>* | Specifies a VRF name. |

### Examples

```
switch(config)# ip route 20.0.0.0/8 10.20.30.44 vrf myvrf
switch(config)# ip route 20.1.2.0/24 1/1/30 vrf myvrf
switch(config)# ip route 1.2.3.4/32 nullroute vrf myvrf
switch(config)# ip route 1.2.3.4/32 reject vrf myvrf
```

```
switch(config)# no ip route 20.0.0.0/8 10.20.30.44 vrf myvrf
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## ipv6 route gc interval

```
ipv6 route-gc-interval <INTERVAL>
no ipv6 route-gc-interval
```

### Description

Sets the garbage collection interval timer to remove invalid or old route entries from kernel route cache.

The **no** form of this command resets the garbage collection interval timer to default (30 seconds).

| Parameter | Description |
|---|---|
| *<INTERVAL>* | Specifies time interval in seconds. Range: 30 to 600. Default: 30. |

### Examples

Setting garbage collection interval timer to 300:

```
switch(config)# ipv6 route-gc-interval 300
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# ipv6 route vrf

```
ipv6 route <DEST-IPV6-ADDR>/<PREFIX> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
vrf <VRF-NAME>
no ipv6 route <DEST-IPV6-ADDR>/<PREFIX> [<NEXT-HOP-IP-ADDR>|<INTERFACE>|reject|nullroute]
vrf <VRF-NAME>
```

## Description

Adds an IPv6 static route in the specified VRF. If no *<VRF-NAME>* is specified it is added to the default VRF.

The **no** form of this command removes an IPv6 static route from the VRF.

| Parameter | Description |
|---|---|
| *<DEST-IPV6-ADDR>* | Specifies an IP address in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<MASK>* | Specifies the number of bits in the address mask in CIDR format (**x**), where **x** is a decimal number from 0 to 128. |
| *<NEXT-HOP-IP-ADDR>* | Specifies the next hop in IPv6 format (**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**), where **x** is a hexadecimal number from 0 to F. |
| *<INTERFACE>* | Specifies the next hop as an outgoing interface. |
| nullroute | Specifies that packets matching the destination prefix are silently discarded and no ICMP error notification is sent to the sender. |
| reject | Specifies that packets matching the destination prefix are discarded and an ICMP error notification is sent to the sender. |
| vrf *<VRF-NAME>* | Specifies the name of a VRF. Default: default. |

## Examples

```
switch(config)# ipv6 route 120::/124 121::2 vrf test
switch(config)# ipv6 route 121::/124 1/1/9 vrf test
switch(config)# ipv6 route 122::/124 nullroute vrf test
switch(config)# ipv6 route 123::/124 reject vrf test
```

```
switch(config)# no ipv6 route 120::/124 121::2 vrf test
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## show ip route

```
show ip route [<A.B.C.D> | <A.B.C.D/M> | all-vrfs | bgp | connected | local | ospf |
static | summary | vrf <VRF-NAME>] [vsx-peer]
```

### Description

Displays IPv4 route tables.

| Parameter | Description |
|---|---|
| **`<A.B.C.D>`** | Display longest prefix match. |
| **`<A.B.C.D/M>`** | Display exact route match. |
| `all-vrfs` | Display information for all VRFs. |
| `bgp` | Display bgp routes only. |
| `connected` | Display connected routes only. |
| `local` | Display local routes only. |
| `ospf` | Display ospf routes only. |
| `static` | Display static routes only. |
| `summary` | Display the aggregate count of routes per routing protocol. |
| `vrf` *`<vrf-name>`* | Specify a VRF by VRF name (if no <*VRF-NAME*> is specified, the default VRF is implied. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Showing IPv4 route tables:

```
switch# show ip route

Displaying ipv4 routes selected for forwarding

'[x/y]' denotes [distance/metric]
10.0.0.0/24, vrf default
```

```
     via  vlan2,  [0/0],  connected
10.0.0.1/32, vrf default
     via  vlan2,  [0/0],  local
10.100.11.0/24, vrf default
     via  vlan1,  [0/0],  connected
10.100.11.82/32, vrf default
     via  vlan1,  [0/0],  local
20.0.0.0/24, vrf default
     via  10.0.0.2,  [1/0],  static
20.0.1.0/24, vrf default
     via  10.0.0.2,  [1/0],  static
20.0.2.0/24, vrf default
     via  vlan1,  [1/0],  static
20.0.4.0/24, vrf default
     nullroute,  [1/0],  static
20.0.5.0/24, vrf default
     reject route,  [1/0],  static
```

Showing IPv4 route tables for the test VRF:

```
switch# show ip route vrf test

Displaying ipv4 routes selected for forwarding

'[x/y]' denotes [distance/metric]

30.0.0.0/24,  1 (nullroute) next-hops
       via  30.0.0.2,  [0/0],  connected
90.0.0.0/24,  1 unicast next-hops
       via  30.0.0.1,  [1/0],  static
90.0.1.0/24,  1 unicast next-hops
       via  1/1/2,  [1/0],  static
90.0.3.0/24, nullroute, 1, [1/0], static
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show ipv6 route

```
show ipv6 route [<X.X.X.X> | <X.X.X.X/M> | all-vrfs | bgp | connected | local | ospf |
static | summary | vrf <vrf-name>] [vsx-peer]
```

## Description

Displays IPv6 route tables.

| Parameter | Description |
|---|---|
| **<X.X.X.X>** | Display exact route match. |
| **<X.X.X.X/M>** | Display exact route match. |
| `all-vrfs` | Display information for all VRFs. |
| `bgp` | Display bgp routes only. |
| `connected` | Display connected routes only. |
| `local` | Display local routes only. |
| `ospf` | Display ospf routes only. |
| `static` | Display static routes only. |
| `summary` | Display the aggregate count of routes per routing protocol. |
| `vrf` *<vrf-name>* | Specify a VRF by VRF name (if no <*VRF-NAME*> is specified, the default VRF is implied. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

Showing IPv6 route tables:

```
switch# show ipv6 route

Displaying ipv6 routes selected for forwarding

'[x/y]' denotes [distance/metric]

1000::/64, vrf default
        via  vlan2,  [0/0],  connected
1000::1/128, vrf default
        via  vlan2,  [0/0],  local
2000::/64, vrf default
        via  vlan2,  [1/0],  static
2001::/64, vrf default
        via  1000::2,  [1/0],  static
3000:2301::/64, vrf default
        nullroute,  [1/0],  static
4000:2301::/64, vrf default
        reject route,  [1/0],  static
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.10 | Inclusive language update. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show vrf

```
show vrf <VRF-NAME>
show vrf
```

## Description

Displays the status and attached interfaces for the specified VRF instance.

The **show vrf** command shows this information for all the VRFs.

| Parameter | Description |
|---|---|
| *<VRF-NAME>* | Specifies the VRF name. Length: Up to 32 alphanumeric characters. |

## Examples

Showing VRF information for the test VRF:

```
switch# show vrf test
VRF Configuration:
------------------
VRF Name   : test
        Interfaces             Status
        -----------------------------
        1/1/29                   up
        1/1/30                   up
```

Showing VRF information for all VRFs:

```
switch# show vrf
VRF Configuration:
------------------
VRF Name   : default
        Interfaces             Status
        -----------------------------

VRF Name   : red
        Interfaces             Status
        -----------------------------
        1/1/32                   up

VRF Name   : test
        Interfaces             Status
        -----------------------------
        1/1/29                   up
        1/1/30                   up
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## vrf

```
vrf <VRF-NAME>
no vrf <VRF-NAME>
```

### Description

Creates a VRF instance named *<VRF-NAME>* and then enters its context. Use **default** for *<VRF-NAME>* to enter the default VRF configure context.

Except for the default VRF, the **no** form of the command deletes the named VRF instance and any IP configuration for interfaces or SVI linked to default VRF. The default VRF cannot be deleted and a warning is given if attempted. To erase the Route-Distinguisher and Route-Targets, enter the default VRF context and delete them manually one by one.

| Parameter | Description |
|---|---|
| *<VRF-NAME>* | Specifies the VRF name. Range: Up to 32 alphanumeric characters. The **mgmt** VRF cannot be used. |

### Examples

Creating the VRF named **cust_A** and then entering its context:

```
switch(config)# vrf cust_A
```

Entering the **default** VRF context:

```
switch(config)# vrf default
```

Deleting the VRF named **test**:

```
switch(config)# no vrf test
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Added default VRF information. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## vrf attach

```
vrf attach <VRF-NAME>
no vrf attach <VRF-NAME>
```

### Description

Attaches the interface to the VRF with the name <*VRF-NAME*>. The command can be entered in several different command contexts.

The **no** form of the command detaches the interface from the named VRF and will remove all configurations from the interface and attach the interface to the default VRF. A warning message is displayed that prompts you whether to proceed: **All Layer 3 configurations associated with the VRF will be deleted. Continue (y/n)?**

| Parameter | Description |
|---|---|
| *<VRF-NAME>* | Specifies the VRF name. Required. Length: Up to 32 alphanumeric characters. |

### Examples

```
switch(config)# interface 1/1/29
switch(config-if)# vrf attach test
```

```
switch(config)# vlan 3
switch(config-vlan)# exit
switch(config)# interface vlan 3
switch(config-if-vlan)# vrf attach test
```

```
switch(config)# vrf test
switch(config)# interface lag 3
switch(config-lag-if)# no shutdown
switch(config-lag-if)# vrf attach test
```

```
switch(config)# interface 1/1/29
switch(config-if)# no vrf attach test
```

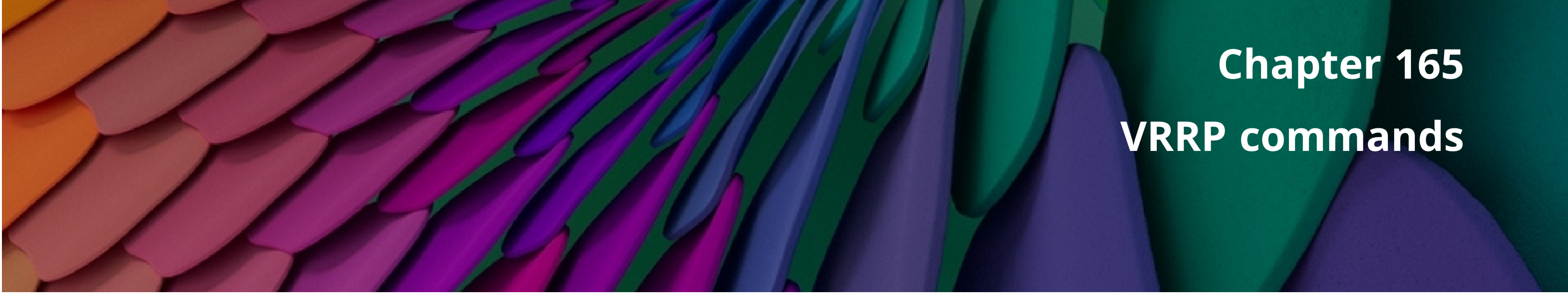
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if`<br>`config-if-vlan`<br>`config-lag-if`<br>`config-gre-if` | Administrators or local user group members with execution rights for this command. |



# Chapter 165
# VRRP commands

## address

```
address <IP-ADDR> [ primary | secondary ]
no address <IP-ADDR> [ primary | secondary ]
```

### Description

Configures a primary or secondary IPv4 or IPv6 address for the VRRP group. To use secondary IP addresses in a VRRP group, you must first configure a primary IP address on the same group. A maximum of 16 IP addresses per IPv4 VRRP group and 8 IPv6 addresses per IPv6 VRRP group are supported.

> Do not configure an IPv4 VRRP group using addresses from the /30, /31, and /32 subnets of the interface IP address.

16 Virtual IP addresses per IPv4 VR and 8 Virtual IP addresses per IPv6 VR are supported.

> The total number of VIPs supported by a switch is:
>
> - 1024 VIPs for IPv4 VRs
> - 512 VIPs for IPv6 VRs

The **no** form of this command deletes a primary or secondary IPv4 or IPv6 address from the VRRP group.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* | Configures the IPv4 or IPv6 address. |
| `primary` | Configures a primary address. |
| `secondary` | Configures a secondary address. |

### Examples

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ipv4
switch(config-if-vrrp)# address 10.0.0.1 primary


switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ipv6
switch(config-if-vrrp)# address fe80::1 primary
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ipv4
switch(config-if-vrrp)# no address 10.0.0.1 primary


switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ipv6
switch(config-if-vrrp)# no address fe80::1 primary
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## authentication

```
authentication {text | md5} [{plaintext | ciphertext} <KEY>]
no authentication
```

### Description

This command enables authentication mode and the authentication key for VRRP groups on an interface. VRRP members or routers of the same VRRP group must use the same authentication mode and authentication key.

The no form of this command disables authentication mode and the authentication key for VRRP groups on an interface.

IPv4 VRRPv3 and IPv6 VRRPv3 do not support VRRP packet authentication. Authentication mode and key configuration take effect only in VRRPv2 (IPv4 only - RFC2338).

In VRRPv3, authentication mode and authentication key settings do not take effect because VRRP Authentication was removed from RFC5798.

VRRP provides the following authentication modes as described in RFC2338:

**Simple authentication**

The sender fills an authentication key into the VRRP packet and the receiver compares the received authentication key with its local authentication key.

If the two authentication keys match, the received VRRP packet is legitimate. Otherwise, the received packet is illegitimate and is discarded.

Authentication key text is sent in the clear and can be seen in a packet trace. This makes MD5 authentication more secure than text.

### MD5 authentication

The sender computes a digest for the packet that will be sent using the authentication key and MD5 algorithm, and saves the result in the VRRP packet.

The receiver performs the same operation with the authentication key and MD5 algorithm, and compares the result with the content in the authentication header. If the results match, the received VRRP packet is legitimate. Otherwise, the received packet is illegitimate and is discarded.

| Parameter | Description |
|---|---|
| `text` | Configures the simple authentication type. |
| `md5` | Configures the MD5 (message-digest) authentication type. |
| `plaintext` | Specifies that the key is provided as plaintext. |
| `ciphertext` | Specifies that the key is provided as ciphertext. |
| *<KEY>* | Specifies the key in the chosen format. |

When the key is not provided on the command line, plaintext key prompting occurs upon pressing Enter. The entered key characters are masked with asterisks.

## Examples

Enabling VRRP authentication using MD5 with a provided plaintext key:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# version 2
switch(config-if-vrrp)# authentication md5 plaintext testvrrpkey
```

Enabling VRRP authentication using MD5 with a prompted plaintext key:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# version 2
switch(config-if-vrrp)# authentication md5
Enter the authentication key: *************
Re-Enter the authentication key: *************
```

Enabling VRRP authentication using MD5 with a provided ciphertext key:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# version 2
switch(config-if-vrrp)# authentication md5 ciphertext
AQBapfciFZ/P...biBAAAAOjc0a8=
```

Disabling VRRP authentication:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# version 2
switch(config-if-vrrp)# no authentication
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if-vrrp` | Administrators or local user group members with execution rights for this command. |

# bfd *<IPV4-ADDR>*

```
bfd <IPV4-ADDR>
no bfd <IPV4-ADDR>
```

## Description

Enables BFD under VRRP for the specified IP address. BFD is asynchronous and echo mode is supported.

The **no** form of this command disables BFD under VRRP for the specified IP address.

| Parameter | Description |
|---|---|
| *<IPV4-ADDR>* | Specifies the address on which to enable BFD in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling BFD on the address **10.0.0.1** on VRRP **1**:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# vrrp 1 address-family ipv4
switch(config-if-vrrp)# bfd 10.0.0.1
```

Disabling BFD on the address **10.0.0.1** on VRRP **1**:

```
switch(config)# interface 1/1/1
switch(config-if)# routing
switch(config-if)# vrrp 1 address-family ipv4
switch(config-if-vrrp)# no bfd 10.0.0.1
```

For more information on features that use this command, refer to the High Availability Guide or IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if-vrrp` | Administrators or local user group members with execution rights for this command. |

## preempt

```
preempt
no preempt
```

### Description

Enables the preempt option. The default value is enabled. In default mode, a Standby router with a higher priority than another Standby that is operating as Active will take over the Active function.

Applies to VRRP Standby routers only and is used to minimize network disruption caused by unnecessary preemption of the Active operation among Standby routers.

The **no** form of this command disables the preempt option, thus preventing the higher-priority Standby from taking over the Active operation from a lower-priority Standby. This command does not prevent an owner router from resuming the Active function after recovering from being unavailable.

### Examples

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# preempt
```

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# no preempt
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# preempt delay minimum

```
preempt delay minimum <DELAY-IN-SECONDS>
no preempt delay minimum <DELAY-IN-SECONDS>
```

## Description

Sets the time in seconds (1-3600) that the router will wait before taking control of the virtual IP and starting to route packets.

The **no** form of this command sets the preempt delay for the VRRP group to the default preempt delay of 0 seconds.

The VRRP Preempt Delay Timer (PDT) allows admin users to configure a period of time before the VR takes control of the virtual IP address. It does not transition to the Active state until the timer period expires.

The timer value configured should be long enough to allow upper layer protocol to converge. The PDT is applied during initialization and down/up events of the router.

| Parameter | Description |
|---|---|
| *<DELAY-IN-SECONDS>* | Selects the time in seconds (1-3600). Default is 0 seconds. |

## Examples

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# preempt delay minimum 30

switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# no preempt delay
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## priority

```
priority <1-254>
no priority
```

### Description

Sets the priority for the VRRP group.

The **no** form of this command sets the priority for the VRRP group as default priority.

- The default value for non-Owner virtual routers is 100.
- The default value for Owner virtual router is 255, which cannot be changed.

### Examples

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# priority 150
```

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# no priority
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# router vrrp {enable | disable}

```
router vrrp {enable | disable}
no router vrrp {enable | disable}
```

## Description

Enables or disables VRRP protocol globally. You must globally enable the VRRP feature for VRRP virtual router.

**no router vrrp enable** disables VRRP protocol globally but does not remove all VRRP configurations.

**no router vrrp disable** enables VRRP protocol globally.

## Example

Enabling VRRP protocol globally:

```
switch(config)# router vrrp enable
```

Disable VRRP protocol globally:

```
switch(config)# router vrrp disable
```

Disable VRRP protocol globally:

```
switch(config)# no router vrrp enable
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# no router vrrp

```
no router vrrp
```

## Description

Removes VRRP configuration and VRRP global protocol. If **auto-confirm** is enabled or VRRP is not configured on any interface, this command will not ask for user confirmation.

## Examples

Removing VRRP configuration:

```
switch(config)# no router vrrp
All VRRP configuration will be deleted.
Do you want to continue (y/n)?
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# show track

`show track [brief | <OBJECT-ID>]`

## Description

Shows all or specific track object information.

| Parameter | Description |
|---|---|
| `brief` | Displays brief information about all or specific track objects |
| *`<OBJECT-ID>`* | Displays information about a specified track object (1-128) |

## Examples

```
switch# show track
Track 1
  interface 1/1/1
  Interface is DOWN
```

```
switch# show track brief
Track  Interface        State

1      1/1/1            Down
2      None             Down
3      1/1/2            Up
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show track brief

```
show track brief
```

### Description

Shows brief information for all track objects.

### Examples

Showing brief information for all track objects:

```
switch# show track brief
Track  Interface       State

1      1/1/1           Down
2      None            Down
3      1/1/2           Up
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vrrp

```
show vrrp [brief | detail | interface <INTERFACE-NAME> | interface <LAG-NAME> | interface
<VLAN-NAME> | ip | ipv6 | statistics | statistics interface <INTERFACE-NAME> | statistics
interface <LAG-NAME> | statistics interface <VLAN-NAME>]
[vsx-peer]
```

### Description

Shows all VRRP virtual routers information.

| Parameter | Description |
|---|---|
| `brief` | Displays brief output of all VRRP virtual routers<br>Keywords used in displayed information:<br>Grp: VRRP virtual router group ID.<br>A-F: Address Family.<br>Pri: Priority.<br>Time: Uptime of VRRP virtual router since it moved out of INIT state.<br>Pre: Preempt mode (Y is enabled, N if not enabled). |
| `detail` | Displays detailed output of all VRRP virtual routers |
| `interface <INTERFACE-NAME>` | Displays VRRP information for a specific interface |
| `interface <LAG-NAME>` | Displays VRRP information for a specific LAG interface |
| `interface <VLAN-NAME>` | Displays VRRP information for a specific VLAN interface |
| `ip` | Displays the IPv4 address family |
| `ipv6` | Displays IPv6 address family |
| `statistics` | Displays VRRP statistics information for all interfaces |
| `statistics interface <INTERFACE-NAME>` | Displays VRRP statistics information for a specific interface |
| `statistics interface <LAG-NAME>` | Displays VRRP statistics information for a specific LAG interface |
| `statistics interface <VLAN-NAME>` | Displays VRRP statistics information for a specific VLAN interface |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

```
switch# show vrrp
VRRP is enabled

Interface 1/1/1 - Group 1 - Address-Family IPv

  State is ACTIVE
  State duration 56 mins 57.826 secs
  Virtual IP address is 10.0.0.1
  Virtual MAC address is 00:00:5e:00:01:01
  Advertisement interval is 1000 msec
  Preemption enabled
  Priority is 100
  Active Router is 10.0.0.2 (local), priority is 100
  Active Advertisement interval is 1000 msec
  Active Down interval is unknown
  Tracked object ID is 1, and state Down

Interface 1/1/2 - Group 1 - Address-Family IPv4
  State is INIT (Interface Down)
  State duration 45 mins 28.313 secs
  Virtual IP address is no address
  Virtual MAC address is 00:00:5e:00:01:01
  Advertisement interval is 1000 msec
  Preemption enabled
  Priority is 100
  Active Router is unknown, priority is unknown
  Active Advertisement interval is unknown
  Active Down interval is unknown

Interface 1/1/2 - Group 1 - Address-Family IPv6
  State is INIT (Group Disabled)
  State duration 20 mins 19.794 secs
  Virtual IP address is no address
  Virtual secondary IP addresses:
    2201:13::110:4
  Virtual MAC address is 00:00:5e:00:02:01
  Advertisement interval is 1000 msec
  Preemption enabled
  Priority is 100
  Active Router is unknown, priority is unknown
  Active Advertisement interval is unknown
  Active Down interval is unknown
```

```
switch# show vrrp brief

VRRP is enabled

 Interface   Grp  A-F   Pri   Time Owner Pre State   Active addr/Group addr
  1/1/1       1   IPv4  100    0    N    Y   ACTIVE  10.0.0.2(local) 10.0.0.1
  1/1/2       1   IPv4  100    0    N    Y   INIT    AF-UNDEFINED no address
  1/1/2       1   IPv6  100    0    N    Y   INIT    AF-UNDEFINED no address
```

```
switch# show vrrp detail
VRRP is enabled

Interface 1/1/1 - VRRPv2 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface 1/1/1 - VRRPv3 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface 1/1/1 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 1 mins 35.486 secs
  Virtual IP address is 10.0.0.1
  Virtual MAC address is 00:00:5e:00:01:01
  Advertisement interval is 1000 msec
  Version 3
  Preemption enabled
  Priority is 100
  Active Router is 10.0.0.2 (local), priority is 100
  Active Advertisement interval is 1000 msec
  Active Down interval is unknown
  Tracked object ID is 1, and state Down
  VRRPv3 Advertisements: sent 3931 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 3537
    IP address Owner conflicts: 0
    IP address configuration mismatch : 3537
    Advert Interval errors : 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 2 (Last change Mon Jun 16 11:19:36.316 UTC)
    Standby to active: 2 (Last change Mon Jun 16 11:19:39.926 UTC)
    Active to standby: 0
    Active to init: 1 (Last change Mon Jun 16 11:17:49.978 UTC)
    Standby to init: 0

Interface 1/1/2 - VRRPv2 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface 1/1/2 - VRRPv3 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface 1/1/2 - Group 1 - Address-Family IPv4
  State is INIT (Interface Down)
  State duration 49 mins 23.507 secs
  Virtual IP address is no address
  Virtual MAC address is 00:00:5e:00:01:01
  Advertisement interval is 1000 msec
  Version 3
  Preemption enabled
  Priority is 100
  Active Router is unknown, priority is unknown
  Active Advertisement interval is unknown
  Active Down interval is unknown
  VRRPv3 Advertisements: sent 0 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 0
    IP address Owner conflicts: 0
    IP address configuration mismatch : 0
    Advert Interval errors: 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 0
    Standby to active: 0
    Active to standby: 0
    Active to init: 0
    Standby to init: 0

Interface 1/1/2 - Group 1 - Address-Family IPv6
  State is INIT (Interface Down)
  State duration 24 mins 14.988 secs
  Virtual IP address is no address
  Virtual secondary IP addresses:
    2201:13::110:4
  Virtual MAC address is 00:00:5e:00:02:01
  Advertisement interval is 1000 msec
  Preemption enabled
  Priority is 100
  Active Router is unknown, priority is unknown
  Active Advertisement interval is unknown
  Active Down interval is unknown
  VRRPv3 Advertisements: sent 0 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 0
    VRRPv2 incompatibility: 0
    IP address Owner conflicts: 0
    IP address configuration mismatch : 0
    Advert Interval errors : 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 0
    Standby to active: 0
    Active to standby: 0
    Active to init: 0
    Standby to init: 0
```

```
switch# show vrrp interface 1/1/1
VRRP is enabled

Interface 1/1/1 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 11 mins 21.617 secs
  Virtual IP address is 10.0.0.1
  Virtual MAC address is 00:00:5e:00:01:01
  Advertisement interval is 1000 msec
  Version 3
  Preemption enabled
  Priority is 100
  Active Router is 10.0.0.2 (local), priority is 100
  Active Advertisement interval is 1000 msec
  Active Down interval is unknown
```

```
switch# show vrrp interface lag10
VRRP is enabled

Interface lag10 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 11 mins 21.617 secs
  Virtual IP address is 10.0.0.1
  Virtual MAC address is 00:00:5e:00:01:01
  Advertisement interval is 1000 msec
  Version 3
  Preemption enabled
  Priority is 100
  Active Router is 10.0.0.2 (local), priority is 100
  Active Advertisement interval is 1000 msec
  Active Down interval is unknown
```

```
switch# show vrrp interface vlan100
VRRP is enabled

Interface vlan100 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 11 mins 21.617 secs
  Virtual IP address is 10.0.0.1
  Virtual MAC address is 00:00:5e:00:01:01
  Advertisement interval is 1000 msec
  Version 3
  Preemption enabled
  Priority is 100
  Active Router is 10.0.0.2 (local), priority is 100
  Active Advertisement interval is 1000 msec
  Active Down interval is unknown
```

```
switch# show vrrp statistics

VRRP is enabled

Interface 1/1/1 - VRRPv2 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface 1/1/1 - VRRPv3 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

VRRP Statistics for interface 1/1/1 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 6 mins 55.006 secs
  VRRPv3 Advertisements: sent 4288 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 3856
    IP address Owner conflicts: 0
    IP address configuration mismatch : 0
    Advert Interval errors : 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 2 (Last change Mon Jun 16 11:19:36.316 UTC)
    Standby to active: 2 (Last change Mon Jun 16 11:19:39.926 UTC)
    Active to standby: 0
    Active to init: 1 (Last change Mon Jun 16 11:17:49.978 UTC)
    Standby to init: 0

Interface 1/1/2 - VRRPv2 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface 1/1/2 - VRRPv3 Statistics
```

```
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

VRRP Statistics for Interface 1/1/2 - Group 1 - Address-Family IPv4
  State is INIT (No Primary Group Address)
  State duration 54 mins 43.027 secs
  VRRPv3 Advertisements: sent 0 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 0
    IP address Owner conflicts: 0
    Invalid address count: 0
    IP address configuration mismatch : 0
    Advert Interval errors : 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 0
    Standby to active: 0
    Active to standby: 0
    Active to init: 0
    Standby to init: 0

VRRP Statistics for Interface 1/1/2 - Group 1 - Address-Family IPv6
  State is INIT (Interface Down)
  State duration 29 mins 34.508 secs
  VRRPv3 Advertisements: sent 0 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 0
    IP address Owner conflicts: 0
    IP address configuration mismatch : 0
    Advert Interval errors: 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 0
    Standby to active: 0
    Active to standby: 0
    Active to init: 0
    Standby to init: 0
```

```
switch# show vrrp statistics interface 1/1/1

VRRP is enabled

Interface 1/1/1 - VRRPv2 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface 1/1/1 - VRRPv3 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

VRRP Statistics for interface 1/1/1 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 6 mins 55.006 secs
  VRRPv3 Advertisements: sent 4288 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 3856
    IP address Owner conflicts: 0
    IP address configuration mismatch : 0
    Advert Interval errors : 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 2 (Last change Mon Jun 16 11:19:36.316 UTC)
    Standby to active: 2 (Last change Mon Jun 16 11:19:39.926 UTC)
    Active to standby: 0
    Active to init: 1 (Last change Mon Jun 16 11:17:49.978 UTC)
    Standby to init: 0
```

```
switch# show vrrp statistics interface lag10

VRRP is enabled

Interface lag10 - VRRPv2 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface lag10 - VRRPv3 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

VRRP Statistics for interface lag10 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 6 mins 55.006 secs
  VRRPv3 Advertisements: sent 4288 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 3856
    IP address Owner conflicts: 0
    IP address configuration mismatch : 0
    Advert Interval errors : 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 2 (Last change Mon Jun 16 11:19:36.316 UTC)
    Standby to active: 2 (Last change Mon Jun 16 11:19:39.926 UTC)
    Active to standby: 0
    Active to init: 1 (Last change Mon Jun 16 11:17:49.978 UTC)
    Standby to init: 0
```

```
switch# show vrrp statistics interface vlan100

VRRP is enabled

Interface vlan100 - VRRPv2 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

Interface vlan100 - VRRPv3 Statistics
   Invalid group ID packets received : 0
   Invalid version packets received : 0
   Invalid checksum packets received : 0

VRRP Statistics for interface vlan100 - Group 1 - Address-Family IPv4
  State is ACTIVE
  State duration 6 mins 55.006 secs
  VRRPv3 Advertisements: sent 4288 (errors 0) - rcvd 0
  VRRPv2 Advertisements: sent 0 (errors 0) - rcvd 0
  Group Discarded Packets: 3856
    IP address Owner conflicts: 0
    IP address configuration mismatch : 0
    Advert Interval errors : 0
    Adverts received in Init state: 0
    Invalid group other reason: 0
  Group State transition:
    Init to active: 0
    Init to standby: 2 (Last change Mon Jun 16 11:19:36.316 UTC)
    Standby to active: 2 (Last change Mon Jun 16 11:19:39.926 UTC)
    Active to standby: 0
    Active to init: 1 (Last change Mon Jun 16 11:17:49.978 UTC)
    Standby to init: 0
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated. |
| 10.08 | Updated command output for inclusive language |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## shutdown

```
shutdown
no shutdown
```

### Description

Enables standby VRRP groups on the interface to route the traffic sent to virtual router's MAC address.

It is recommended to enable this mode on VLANs where mc-lags are configured.

Disabled by default.

The **no** form of this command disables standby VRRP groups on the interface to route the traffic sent to virtual router's MAC address.

Only supported on SVI interfaces.

### Examples

Enabling standby VRRP groups on interface VLAN 10 to route traffic sent to the router's MAC address:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# vrrp dual-active-forwarding
```

Disabling the ability of standby VRRP groups on interface VLAN 10 to route traffic sent to the router's MAC address:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no vrrp dual-active-forwarding
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.12.1000 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

## timers advertise

```
timers advertise <ADVERTISE-IN-MILLISECONDS>
no timers advertise
```

### Description

Sets the advertisement interval in ms (100-40950). The default value is 1000. Advertisement interval can be configured in multiples of 1,000 ms.

The **no** form of this command sets the advertisement interval in ms to the default value of 1000.

This release does not support sub-second timer for VRRPv3.

### Examples

Setting the advertisement interval in ms to 2000:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# timers advertise 2000
```

Setting the advertisement interval in ms to the default value of 1000:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# no timers advertise
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## track (VRRP group)

```
track <OBJECT-ID>
no track <OBJECT-ID>
```

### Description

Sets the track object ID (1-128) for the group. The track object is first configured globally for the interface and then attached to the VRRP virtual router.

The track object must not track the same interface for which a VRRP group is configured.

The **no** form of this command removes the track object ID from the group.

### Examples

Setting the track object ID for the group:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# track 1
```

Removing the track object ID from the group:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# no track 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## track (VRRP virtual router)

```
track <OBJECT-ID>
no track <OBJECT-ID>
```

### Description

Configures a track object that can be associated with an interface. A change in interface state will then affect the priority of a VRRP group. By default, no interface is associated to a track object, so state is down.

The **no** form of this command deletes a tracked object for an interface. If it is not associated with a VRRP virtual router, a track object cannot be deleted.

Track cannot be configured by using port with no routing.

When all tracked interfaces go down on a virtual router, priority is automatically set to zero instead of its configured value. Owner virtual routers always use a default priority of 255.

| Parameter | Description |
|---|---|
| *<OBJECT-ID>* | Specify the track object ID value. Range: 1 to 128. |

### Examples

Configuring a tracked object:

```
switch(config)# track 1
```

Deleting a tracked object:

```
switch(config)# no track 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## track by

```
track by <OBJECT-ID>
no track by <OBJECT-ID>
```

### Description

Specifies an interface to be tracked when changes in the state of the interface affect the priority of a VRRP group. Once track is associated with an interface, the track state reflects the interface forwarding state.

The **no** form of this command removes an interface from tracking, affecting VRRP states of any interfaces associated with VRRP groups.

The VLAN interface 1 is always tracked.

| Parameter | Description |
|---|---|
| *<OBJECT-ID>* | Specifies the track object ID value. Range: 1 to 128. |

### Example

Specifying an interface to be tracked:

```
switch (config)# interface 1/1/1
switch (config-if)# track by 1
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## version

`version <VERSION-NUMBER>`

### Description

Sets the protocol version for the VRRP group. Version change is allowed only for the IPv4 address-family. The default value is 2, which supports IPv4 with minimum 1 second advertisement interval. Value 3 supports IPv4 and IPv6 with minimum 1 second advertisement interval.

| Parameter | Description |
|---|---|
| *<VERSION-NUMBER>* | Specifies the VRRP protocol version. Possible values: 2 or 3. The default value is 2, which supports IPv4 with a minimum 1 second advertisement interval. |

### Example

Setting the protocol version for the VRRP group to 3:

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)# version 3
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# vrrp

```
vrrp <VRID> address-family {ip | ipv6}
no vrrp <VRID> address-family {ip | ipv6}
```

## Description

Creates a VRRP group and establishes VRRP group configuration context.

- A maximum of 16 VRRP groups, including both IPv4 and IPv6, are supported on an interface.
- A maximum of 256 VRRP groups is supported on a router. The groups can be IPv4 or IPv6 on a first come first serve basis.

The **no** form of this command deletes a VRRP group.

| Parameter | Description |
|---|---|
| `<VRID>` | Selects the VRRP router ID value. Range: 1 to 255. |
| `address-family [IP\| IPv6]` | Specifies which address family to use, IP or IPv6. |

## Examples

```
switch(config)# interface 1/1/1
switch(config-if)# vrrp 1 address-family ip
switch(config-if-vrrp)#

switch(config-if-vrrp)# no vrrp 1 address-family ip
```

For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.14 | Replaced the **ipv4** parameter with the **ip** parameter. The **ipv4** parameter is deprecated. |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# vrrp dual-active-forwarding

```
vrrp dual-active-forwarding
no vrrp dual-active-forwarding
```

## Description

Allows standby VRRP groups on an interface to route traffic sent to a virtual router's MAC address.

It is recommended to enable VRRP dual active forwarding on VLANs configured on MCLAG interfaces.

Disabled by default.

The **no** form of this command prevents standby VRRP groups on the interface to route traffic sent to the virtual router's MAC address.

VRRP dual active forwarding is only supported on SVI interfaces.

VRRP dual active forwarding and VRRP owner mode are mutually exclusive.

To verify the configuration of **vrrp dual-active-forwarding** use the `show vrrp` command.

## Examples

Enabling VRRP dual active forwarding on interface VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# vrrp dual-active-forwarding
```

Disabling VRRP dual active forwarding on interface VLAN 10:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no vrrp dual-active-forwarding
```

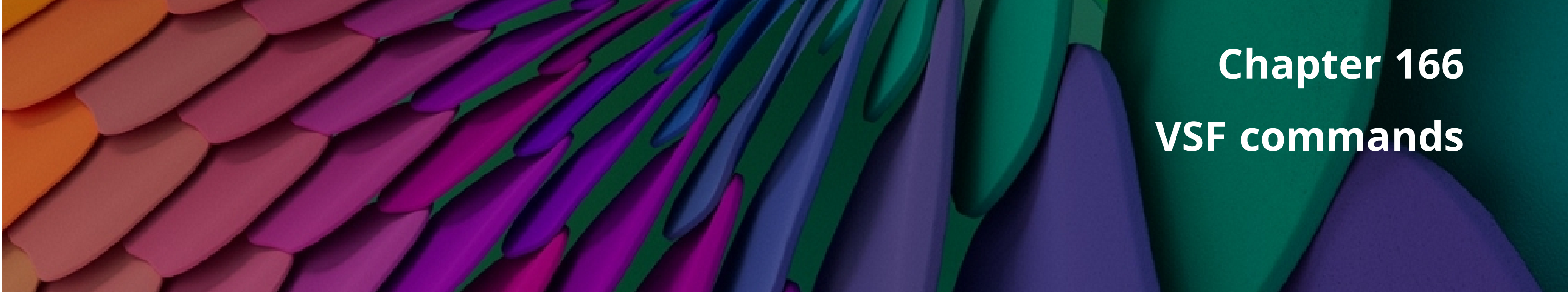
For more information on features that use this command, refer to the IP Routing Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.12.1000 | Command introduced. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-if-vlan` | Administrators or local user group members with execution rights for this command. |



# Chapter 166

# VSF commands

## description

```
description
no description
```

### Description

Adds a description for one or more VSF link interfaces.

The **no** form of this command removes the interface description.

### Examples

Adding a description for VSF link interface **1/1/25**:

```
switch(config)# interface 1/1/25
switch(config-if-vsf)# description mem 1 intf 1/1/25
```

Removing the description from interface 1/1/25

```
switch(config)# int 1/1/25
switch(config-if-vsf)# no description
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config-if-vsf` | Administrators or local user group members with execution rights for this command. |

## interface

```
interface <IFRANGE>
```

### Description

Enters configuration context for one or more VSF link interfaces.

VSF link interfaces cannot be included in a range with other interfaces.

| Parameter | Description |
|---|---|
| *<IFRANGE>* | Poet identifier range. Required. |

### Examples

Entering configuration context:

```
switch(config)# interface 1/1/1
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config` | Administrators or local user group members with execution rights for this command. |

## issu rollback-timer

`issu rollback-timer [wait-time <TIME>]`

### Description

Enables the ISSU rollback timer on the system. The rollback timer automatically rolls the system back to the configuration and OS image used before starting the ISSU, unless the upgrade is confirmed with `issu update-software confirm`. Changing the rollback-timer will not affect an active timer and will apply on the next ISSU. To cancel the active timer, confirm the previous ISSU with `issu update-software confirm`. Disabled by default.

The **no** form of this command disables the rollback timer on the system.

| Parameter | Description |
|---|---|
| *<TIME>* | Specifies how many minutes the system will wait for confirmation |

| Parameter | Description |
|---|---|
| | that the last ISSU is accepted before triggering a system reboot and roll back to the previous configuration and OS version. This change will not affect an active timer and will apply on the next ISSU. Range: 30-1440. |

## Examples

Enabling the ISSU rollback timer:

```
switch(config)# issu rollback-timer
```

Disabling the ISSU rollback timer:

```
switch(config)# no issu rollback-timer
```

Disabling the ISSU rollback timer on the system while a previous ISSU's timer is active:

```
switch(config)# no issu rollback-timer
The ISSU rollback timer is active. This change will apply on the next ISSU
operation
To cancel the active timer, confirm the previous ISSU with 'issu update-software
confirm'
```

Setting the ISSU rollback timer wait time to 80 minutes:

```
switch# issu rollback-timer wait-time 80
```

Setting the ISSU rollback timer wait time to 81 minutes while a previous ISSU's timer is active:

```
switch# issu rollback-timer wait-time 81
The ISSU rollback timer is active. This change will apply on the next ISSU
operation
```

Resetting the ISSU rollback timer wait time to default:

```
switch(config)# no issu rollback-timer wait-time
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300, except for S3L75A, S3L76A and S3L77A | `config` | Administrators or local user group members with execution rights for this command. |

# issu update-software

```
issu update-software [validate|confirm]
```

### Description

Initiates ISSU to the alternate boot location. The newer operating system image must be downloaded to the alternate boot location prior to running this command. Additionally, the current running operating system version must match the version that is stored in the current boot location or ISSU will not be allowed.

This operation is disruptive and will result in the management interface being disconnected during the process.

Starting an ISSU will cause the running configuration to be saved in case an error is encountered that requires a reboot to recover the switch. In addition, a special configuration checkpoint will be stored to disk and is used to roll back to the pre-ISSU firmware. During the ISSU process all management methods (CLI, REST, WebUI) will be blocked from making configuration changes to the switch. The configuration block is active from the time ISSU starts until the time ISSU switchover is complete. fter the ISSU switchover is completed, switch configuration can resume.

| Parameter | Description |
|---|---|
| `validate` | Runs all pre-ISSU validations without executing the actual upgrade. The validation runs in the background, however its results will be displayed in real time for approximately the next three minutes . If the validation is not finished within that time frame or if the display is aborted with Control+C or Control+Z, the results can be queried using the `show issu validation` command. |
| `confirm` | Confirms the software update and cancels the configured rollback timer. If the rollback timer is configured then this command has to be executed after an ISSU before the timer expires. Else, the pre-ISSU checkpoint is copied to the startup configuration and the system is rebooted to the image used before ISSU.<br>**Note: To perform an intentional system rollback before the timer expires, a manual downgrade must be executed through the following steps:**<br>1. Copy the pre-ISSU checkpoint to the startup configuration using the `copy checkpoint pre-issu-startup-config startup-config` command. |

| Parameter | Description |
|---|---|
| | 2. Boot to the previous image using the `boot system` command. |

## Usage

Note the following points before running this command:

- The newer operating system image must be downloaded to the alternate boot location prior to running this command.
- The current running operating system version must match the version that is stored in the current boot location or ISSU will not be allowed.
- This operation is disruptive and will result in the management interface being disconnected during the process.
- The running configuration will be stored in case an error is encountered that requires a reboot to recover the switch.
- During the ISSU process all management methods (CLI, REST, WebUI) are blocked from making configuration changes to the switch. The configuration changes are not allowed from the time ISSU starts until ISSU switchover is complete. fter the ISSU switchover is completed, switch configuration can resume.
- In case of ISSU, conductor gets transitioned to standby role without reboot.
- The stack topology must be a ring before initiating ISSU. ISSU is not supported in chain topologies and the process is aborted if the ISSU is initiated.
- During the ISSU process, the **show core-dump all**, **show tech all**, and **copy support-files** commands all may fail to run or display correct output.

## Examples

Initiating an ISSU:

```
switch# issu update-software
This command will perform an in-service software upgrade
using pre-staged secondary operating system image
FL.10.13.1000M
This will save the current running configuration
WARNING:
The rollback timer is enabled and configured to 30 minutes.
After the upgrade is done, execute "issu update-software confirm"
to confirm the new image works as expected. If the command is not
entered, the system will be rebooted to the previous version.

Continue (y/n)? y
```

```
Starting in-service software upgrade.

Use "show issu" to monitor status and progress.

Use "show events -c issu" to view event notifications.
```

Initiating an ISSU, but stopping it without confirming the upgrade:

```
switch(config)# issu update-software

This command will perform an in-service software upgrade
using pre-staged secondary operating system image
FL.10.13.1000M
This will save the current running configuration

WARNING:

The rollback timer is enabled and configured to 30 minutes.
After the upgrade is done, execute "issu update-software confirm"
to confirm the new image works as expected. If the command is not
entered, the system will be rebooted to the previous version.


Continue (y/n)? n
In-service software upgrade aborted. No changes were made.
```

Confirming the ISSU configuration when the rollback timer has been configured and started:

```
switch# issu update-software confirm

The ISSU has been confirmed and the rollback timer has been cancelled.
```

Confirming the ISSU configuration when the rollback timer has not started:

```
switch# issu update-software confirm

No rollback timer has been started, no action was done.
```

Executing an ISSU "dry run" where all pre-ISSU validations are run without executing the actual upgrade:

```
switch# issu update-software validate

ISSU Validation

=======================
Condition                   Status

-----------------------------------------------------------
Current Image Valid         ---
Target Image Valid          ---
Target Version Compatible   ---
Management Modules Ready    ---
Line Modules Ready          ---
Features Ready              ---

In Progress[/]
```

Executing an ISSU "dry run" where all pre-ISSU validations are run and the user aborts the ISSU validation on screen display without user confirmation:

```
switch# issu update-software validate

ISSU Validation

=======================
Condition                   Status

-----------------------------------------------------------
Current Image Valid         Pass
Target Image Valid          Pass
Target Version Compatible   Failed
Management Modules Ready    ---
Line Modules Ready          ---
Features Ready              ---

In Progress[\]
To view the validation progress and results, execute "show issu validation"
```

Executing an ISSU "dry run" where all pre-ISSU validations are run without executing the actual upgrade and the validation progress has finished successfully:

```
switch# issu update-software validate

ISSU Validation

=======================
Condition                   Status

-----------------------------------------------------------
Current Image Valid         Pass
Target Image Valid          Pass
Target Version Compatible   Pass
Management Modules Ready    Pass
Line Modules Ready          Pass
Features Ready              Pass

ISSU Validation has completed
```

Executing an ISSU validation while a previous ISSU is unconfirmed, i.e. the rollback timer is still running:

```
switch# issu update-software validate
The previous ISSU has not been confirmed. Please confirm it with
'issu update-software confirm' before starting a new ISSU or running a validation.
```

Executing an ISSU "dry run" when the validations are taking more than three minutes to complete, then checking the result of the validation afterwards:

```
switch# issu update-software validate
ISSU validation is taking longer than expected. Check the final result with 'show
issu validation'

switch# show issu validation
```

```
ISSU Validation
=======================

Condition                       Status
-----------------------------------------------------------

Current Image Valid               Pass
Target Image Valid                Pass
Target Version Compatible         Pass
Management Modules Ready          Pass
Line Modules Ready                Pass
Features Ready                    Pass
```

Following example shows ISSU performed with chain topology:

```
switch# issu update-software
Stack topology is not a ring. ISSU upgrade aborted.
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11 | Validate and confirm parameters added. |
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300, except for S3L75A, S3L76A and S3L77A | `config` | Administrators or local user group members with execution rights for this command. |

## link

```
link <LINK-ID> [<IFRANGE>][description <DESCRIPTION>]
no link <LINK-ID> [<IFRANGE>][description <DESCRIPTION>]
```

### Description

Creates or modifies a VSF link. The user can specify the physical interfaces that make up the VSF link.

Once an interface is part of a VSF link, all existing configuration on the interface is removed and the interface will operate as a VSF interface. At least one interface must be specified for the creation of a VSF link. VSF interfaces carry VSF traffic and can only be connected to other VSF interfaces. Before removing an individual interface from the VSF link using the `no vsf link <x> <interface>` command, ensure that the interface is administratively shutdown at both local and peer ends.

Interface(s) configured with MACsec cannot be added as VSF links. You have to remove the MACsec configuration before adding an interface to a VSF link.

The **no** form of the command can be used to remove interfaces from a link or remove the link completely.

When configuration is removed from a link, it may cause the stack to split.

| Parameter | Description |
|---|---|
| *<LINK-ID>* | The VSF link number. Range: 1 to 2. |
| *<IFRANGE>* | The interface identifier range. |
| *<DESCRIPTION>* | Adds a description for the link. Range: 1 to 64 printable ASCII characters. |

### Examples

Creating a VSF link called **link 1** with an interface range of **1/1/51** and a description, and a VSF link called **link 2** with an interface range of **1/1/52**:

```
switch(vsf-member-1)# link 1 1/1/51
switch(vsf-member-1)# link 1 description link 1 connected to member 2
switch(vsf-member-1)# link 2 1/1/52
```

Removing VSF **link 1** and **link 2** completely:

```
switch(vsf-member-1)# no link 1
switch(vsf-member-1)# no link 2
```

Removing an assigned interface **1/1/51** from VSF **link 1**:

```
switch(vsf-member-1)# no link 1 1/1/51
```

Attempting to add an interface configured with MACsec to a VSF link:

```
switch(vsf-member-1)# link 1 1/1/51
VSF link cannot be configured on an interface with MACsec policy enabled.
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Added the `description` parameter. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `vsf-member-<ID>` | Administrators or local user group members with execution rights for this command. |

## member

`member <MEMBER-ID>`

### Description

Connects to the specified member in a VSF environment.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | VSF member ID.<br>■ Range for 6300 devices: 1-10. |

### Examples

VSF stack is formed with two members:

```
switch# member 2
admin@172.17.17.2's password:

Last login: 2019-09-30 11:42:17 from the console
User "admin" has logged in 1 time in the past 30 days
member-2#
```

Member to self:

```
switch# member 1
Already on member id 1
```

VSF stack is not formed and member not available:

```
switch# member 2
No stack role for member id 2
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## type

```
type <TYPE>
no type <TYPE>
```

### Description

Configures the part number of the VSF member being provisioned. After provisioning, the interfaces of the member are available for configuration.

When the member eventually joins the stack, it will boot up with the configuration made on the pre-provisioned interfaces.

To provision a member, the member number and the part number of the member must be specified.

The **no** form of this command removes the configuration for the part number of the VSF member provisioned.

| Parameter | Description |
|---|---|
| *<TYPE>* | The part number of the member being provisioned. Required. |

### Examples

Configuring the part number of a VSF member:

```
switch(vsf-member-2)#
  type  The part number of the member being provisioned

switch(vsf-member-2)# type ?
  jl658a  6300M 24SFP+ /4SFP56 Switch
  jl659a  6300M 48SR PoE CLS 6 /4SFP56 Switch
  jl660a  6300M 24SR PoE CLS 6 /4SFP56 Switch
  jl661a  6300M 48G PoE CLS 4 /4SFP56 Switch
  jl662a  6300M 24G PoE CLS 4 /4SFP56 Switch
  jl663a  6300M 48G /4SFP56 Switch
  jl664a  6300M 24G /4SFP56 Switch
  jl665a  6300F 48G PoE CLS 4 /4SFP56 Switch
  jl666a  6300F 24G PoE CLS 4 /4SFP56 Switch
  jl667a  6300F 48G /4SFP56 Switch
  jl668a  6300F 24G /4SFP56 Switch
  jl762a  6300M 48G 4SFP56 Pwr2Prt Switch

switch(vsf-member-2)# type jl662a
switch(vsf-member-2)# show running-config
Current configuration:
!
!Version AOS-CX
!
!
!
!
ssh maximum-auth-attempts 6
!
!
!
!
!
vlan 1
vsf member 1
    type jl661a
exit
vsf member 2
    type jl662a
exit
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `vsf-member-`*`<ID>`* | Administrators or local user group members with execution rights for this command. |

## shutdown

```
shutdown
no shutdown
```

### Description

Shuts down one or more VSF link interfaces.

The **no** form of this command turns on one or more VSF link interfaces.

### Examples

Shutting down a VSF link interface:

```
switch(config)# interface 1/1/1-1/1/2
switch(config-if-vsf-<1/1/1-1/1/2>)# shutdown
```

Shutdown configuration for VSF interfaces is not persistent across reboots.

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config-if-vsf` | Administrators or local user group members with execution rights for this command. |

## show issu

`show issu [brief|history|validation]`

### Description

Shows information about the current state of ISSU. If no ISSU is currently in progress, the command displays the progress details of the last ISSU.

The command with the **brief** parameter displays a short summary of the ISSU state and indicates if the system is ready to accept an ISSU command and whether or not an ISSU is in progress. If the `brief` parameter is not included, then more details about an in progress ISSU or the last ISSU are displayed.

| Parameter | Description |
|---|---|
| brief | Shows a short summary of the ISSU state. |
| history | Shows details of ISSU software update history. |
| validation | Shows information about the current state of an ISSU validation. |

### Examples

Showing detailed ISSU status with an ISSU in progress for the first time:

```
switch# show issu
ISSU Summary
============
ISSU Status     : In Progress
Current Version : FL.10.13.0005K      Upgrade Version : FL.10.13.1000M
Upgrade Image   : secondary           Start Date      : 2023-11-08 07:01:47
Last ISSU Result: --
Rollback timer  : Not started

ISSU Progress
=============
Upgrade Operation                   Status          Start Date
------------------------------------------------------------------------
Initiate ISSU                       Complete        2023-11-08 07:01:47
Validate System Readiness           In Progress     2023-11-08 07:01:47
Upgrade Standby and Member Modules  Pending         --
Upgrade Line Module Services        Pending         --
Prepare for Switchover              Pending         --
Finalize Upgrade                    Pending         --
ISSU Complete                       Pending         --
```

Showing detailed status for VSF ISSU:

```
switch# show issu
ISSU Summary
============
ISSU Status     : In Progress
Current Version : FL.10.11.0001       Upgrade Version : FL.10.11.1000BD
Upgrade Image   : secondary           Start Date      : 2023-02-02 14:22:31
Last ISSU Result: --
Rollback timer  : Not started

ISSU Progress
=============
Upgrade Operation                   Status          Start Date
------------------------------------------------------------------------
Initiate ISSU                       Complete        2023-02-02 14:22:31
Validate System Readiness           Complete        2023-02-02 14:22:31
Upgrade Standby and Member Modules  In Progress     2023-02-02 14:22:54
Upgrade Line Module Services        Pending         --
Prepare for Switchover              Pending         --
Finalize Upgrade                    Pending         --
ISSU Complete                       Pending         --
```

Showing detailed ISSU status with ISSU in progress after successfully completing a previous ISSU:

```
switch# show issu
ISSU Summary
===========
ISSU Status     : In progress
Current Version : FL.10.10.0001       Upgrade Version : FL.10.10.0002
Upgrade Image   : secondary           Start Date      : 2021-10-15 08:37:49
Last ISSU Result: Completed (Without errors)

ISSU Progress
=============
Upgrade Operation                   Status          Start Date
------------------------------------------------------------------------
Initiate ISSU                       Complete        2021-10-13 23:05:41
Validate System Readiness           Complete        2021-10-13 23:05:41
Upgrade Standby Management Module   Complete        2021-10-13 23:05:41
Upgrade Line Modules                In Progress     2021-10-13 23:07:07
```

```
Prepare for Switchover              Pending         --
Finalize Upgrade                    Pending         --
ISSU Complete                       Pending         --
```

Showing detailed ISSU status with ISSU in progress after aborting the previous ISSU:

```
switch# show issu
ISSU Summary
===========
ISSU Status     : In progress
Current Version : FL.10.10.0001       Upgrade Version : FL.10.10.0002
Upgrade Image   : secondary           Start Date      : 2021-10-15 08:37:49
Last ISSU Result: Aborted (One or more line modules are not ready to start ISSU)

ISSU Progress
=============
Upgrade Operation                   Status          Start Date
------------------------------------------------------------------------
Initiate ISSU                       Complete        2021-10-13 23:05:41
Validate System Readiness           Complete        2021-10-13 23:05:41
Upgrade Standby Management Module   Complete        2021-10-13 23:05:41
Upgrade Line Modules                In Progress     2021-10-13 23:07:07
Prepare for Switchover              Pending         --
Finalize Upgrade                    Pending         --
ISSU Complete                       Pending         --
```

Showing detailed ISSU status with no ISSU in progress and no previous ISSU performed:

```
switch# show issu
ISSU Summary
===========
ISSU Status     : Ready
Current Version : FL.10.10.0001       Upgrade Version : --
Upgrade Image   : --                  Start Date      : --
Last ISSU Result: -- (--)

ISSU Progress
=============
Upgrade Operation                   Status          Start Date
------------------------------------------------------------------------
Initiate ISSU                       --              --
Validate System Readiness           --              --
Upgrade Standby Management Module   --              --
Upgrade Line Modules                --              --
Prepare for Switchover              --              --
Perform Switchover                  --              --
Finalize Upgrade                    --              --
ISSU Complete                       --              --
```

Showing detailed ISSU status after completion and before system is ready to start a new ISSU:

```
switch# show issu
ISSU Summary
===========
ISSU Status     : Not ready
Current Version : FL.10.10.0001       Upgrade Version : --
Upgrade Image   : --                  Start Date      : --
```

```
Last ISSU Result: Completed (Without errors)

ISSU Progress
=============
Upgrade Operation                   Status          Start Date
------------------------------------------------------------------------
Initiate ISSU                       Complete        2021-10-13 23:05:41
Validate System Readiness           Complete        2021-10-13 23:05:41
Upgrade Standby Management Module   Complete        2021-10-13 23:05:41
Upgrade Line Modules                Complete        2021-10-13 23:07:07
Prepare for Switchover              Complete        2021-10-13 23:07:50
Finalize Upgrade                    Complete        2021-10-13 23:07:53
ISSU Complete                       Complete        2021-10-13 23:08:10
```

Showing detailed ISSU status after an error occurred and the process is aborted:

```
switch# show issu
ISSU Summary
============
ISSU Status     : Aborted
Current Version : FL.10.10.0001       Upgrade Version : FL.10.10.0002
Upgrade Image   : secondary           Start Date      : 2021-12-09 19:17:15
Last ISSU Result: Aborted (System failed to prepare for ISSU)

ISSU Progress
=============
Upgrade Operation                   Status          Start Date
------------------------------------------------------------------------
Initiate ISSU                       Complete        2021-12-09 19:17:15
Validate System Readiness           Complete        2021-12-09 19:17:15
Upgrade Standby Management Module   Complete        2021-12-09 19:17:15
Upgrade Line Modules                Error           2021-12-09 19:19:22
Prepare for Switchover              Aborted         --
Finalize Upgrade                    Aborted         --
ISSU Complete                       Aborted         --
```

Showing summary of ISSU status with no ISSU in progress where system is ready to start a new ISSU and with no previous ISSU performed:

```
switch# show issu brief
ISSU Summary
===========
ISSU Status     : Ready
Current Version : FL.10.10.0001       Upgrade Version : --
Upgrade Image   : --                  Start Date      : --
Last ISSU Result: -- (--)
```

Showing summary of ISSU status with no ISSU in progress where system is ready to start a new ISSU and after successfully completing a previous ISSU:

```
switch# show issu brief
ISSU Summary
===========
ISSU Status     : Ready
Current Version : FL.10.10.0001       Upgrade Version : --
Upgrade Image   : --                  Start Date      : --
Last ISSU Result: Completed (Without errors)
```

Showing a summary of ISSU status with no ISSU in progress where system is ready to start a new ISSU amd after aborting the previous ISSU:

```
switch# show issu brief
ISSU Summary
===========
ISSU Status     : Ready
Current Version : FL.10.10.0001       Upgrade Version : --
Upgrade Image   : --                  Start Date      : --
Last ISSU Result: Aborted (One or more line modules are not ready to start ISSU)
```

Showing a summary of ISSU status with ISSU in progress:

```
switch# show issu brief
ISSU Summary
===========
ISSU Status     : In progress
Current Version : FL.10.10.0001      Upgrade Version : FL.10.10.0002
Upgrade Image   : secondary          Start Date      : 2021-10-15 08:37:49
Last ISSU Result: Completed (Without errors)
```

Showing a summary of ISSU status with no ISSU in progress where the system is not ready to start a new ISSU:

```
switch# show issu brief
ISSU Summary
===========
ISSU Status     : Not ready
Current Version : FL.10.10.0001      Upgrade Version : FL.10.10.0002
Upgrade Image   : secondary          Start Date      : 2021-10-15 08:37:49
Last ISSU Result: Completed (Without errors)
```

Showing summary of ISSU status after an error occurred and the process is aborted:

```
switch# show issu brief
ISSU Summary
============
ISSU Status     : Aborted
Current Version : FL.10.10.0001       Upgrade Version : FL.10.10.0002
Upgrade Image   : secondary           Start Date      : 2021-12-09 19:17:15
Last ISSU Result: Aborted (System failed to prepare for ISSU)
```

Showing ISSU validation status per condition/validation:

```
switch# show issu validation

ISSU Validation

=======================
Condition                   Status

-----------------------------------------------------------
Current Image Valid         ---
Target Image Valid          ---
Target Version Compatible   ---
```

```
Management Modules Ready    ---
Line Modules Ready          ---
Features Ready              ---
```

Showing ISSU history:

```
switch# show issu history
Upgrade: 1
   From Version : FL.10.11.0001
   To Version   : FL.10.11.1000
   Start Time   : 2022-09-14 15:37:33
   End Time     : 2022-09-14 15:40:45
   Status       : Completed
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11.1000 | History parameter introduced. |
| 10.11 | Support for 6300 Switch Series added. |
| 10.10 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300, except for S3L75A, S3L76A and S3L77A | Manager (#) | Administrators or local user group members with execution rights for this command. |

## show vsf

```
show vsf
```

### Description

Displays the information about the configuration and status of a VSF stack and its members.

### Example

Showing the information about the configuration and status of a VSF stack and its members (without S0E91A or S0X44A SKU member):

(Applies only to 6300 Switch Series)

```
switch# show vsf
```

```
Force Autojoin              : Disabled
Autojoin Eligibility Status: Not Eligible
MAC Address                 : 38:21:c7:5c:62:40
Egress Shape Rate           : None
Secondary                   : 2
Topology                    : Ring
Status                      : No Split
Split Detection Method      : None


Mbr Mac Address          type           Status
ID
--- ------------------- -------------- ---------------
1   38:21:c7:5c:62:40   JL668A         Conductor
2   18:7a:3b:1b:68:c0   R8S90A         Standby
3   38:21:c7:5c:57:c0   JL668A         Member
4   18:7a:3b:1b:66:40   R8S89A         Member Booting
```

Showing the information about the configuration and status of a VSF stack and its stack members (with S0E91A or S0X44A SKU member):

(Applies only to 6300 Switch Series)

```
switch# show vsf
Force Autojoin              : Disabled
Autojoin Eligibility Status: Not Eligible
MAC Address                 : 08:97:34:b0:0e:00
Egress Shape Rate           : 10000000 kbps
Secondary                   : 2
Topology                    : Chain
Status                      : No Split
Split Detection Method      : None

Mbr MAC Address          Type           Status
ID
--- ------------------- -------------- -----------------
1   08:97:34:b0:0e:00   JL666A         Conductor
2   08:97:34:b1:43:00   JL665A         Standby
3   08:97:34:b7:cc:00   SOE91A         Member
4                       JL662A         Not Present
```

Showing the information about the configuration and status of a VSF stack and its stack members with egress shape rate is populated with **Not Applied** indicating that port shaping failed to apply on one or more active VSF interfaces:

(Applies only to 6300 Switch Series)

```
switch# show vsf

Force Autojoin              : Disabled
Autojoin Eligibility Status: Not Eligible
MAC Address                 : 08:97:34:b0:0e:00
Egress Shape Rate           : Not Applied
Secondary                   : 2
Topology                    : Chain
Status                      : No Split
Split Detection Method      : None
```

```
Mbr MAC Address             Type           Status
ID
--- ------------------- -------------- -----------------
1   08:97:34:b0:0e:00   JL666A         Conductor
2   08:97:34:b1:43:00   JL665A         Standby
3   08:97:34:b7:cc:00   SOE91A         Member
```

The **Egress Shape Rate** displays the operational speed of the stack when the VSF egress port shaping is applied. An error message is displayed if port shaping fails to apply to the interface. The purpose of the VSF port shaping feature is to ensure that all VSF interface operate at a lowest common port speed across the stack. This feature is supported only in the 6300 switch series.

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.13.1000 | Command updated to display **Egress Shape Rate**. Applicable only for 6300 Switch Series. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsf detail

```
show vsf detail
```

### Description

Displays detailed information related to the current state of the VSF stack and the stack members.

### Example

```
switch# show vsf detail

VSF Stack
    MAC Address                  : ec:eb:b8:d0:80:40
   Secondary                    : 2
   Topology                     : Chain
   Status                       : No Split
   Uptime                       : 0d 0h 23m
   Split Detection Method       : None
   Software Version             : SL.10.02.0000-7755
   Force Autojoin               : Disabled
   Autojoin Eligibility Status  : Not Eligible
   Autojoin Ineligibility Reason: Configuration changes detected
   Name                         : Aruba-VSF-6300F
   Contact                      :
   Location                     :

Member ID                       : 1
   MAC Address                  : ec:eb:b8:d0:80:40
   Type                         : JL666A
   Model                        : Aruba 6300F 24G PoE CLS 4 /4SFP56 Switch
   Status                       : Conductor
   ROM Version                  : SL.10.02.0000-7755
   Serial Number                : CN7ZK90012
   Uptime                       : 0d 0h 23m
   CPU Utilization              : 0%
   Memory Utilization           : 20%
   VSF link 1                   : Up, connected to peer member 2, link 1
   VSF link 2                   : Down

Member ID                       : 2
   MAC Address                  : eb:ec:d8:e0:50:60
   Type                         : JL666A
   Model                        : Aruba 6300F 24G PoE CLS 4 /4SFP56 Switch
   Status                       : Standby
   ROM Version                  : SL.10.02.0000-7755
   Serial Number                : CN7ZK90012
   Uptime                       : 0d 0h 23m
   CPU Utilization              : 0%
   Memory Utilization           : 15%
   VSF link 1                   : Up, connected to peer member 1, link 1
   VSF link 2                   : Down

Member ID                       : 3
   MAC Address                  :
   Type                         : JL666A
   Model                        : Aruba 6300F 24G PoE CLS 4 /4SFP56 Switch
   Status                       : Not Present
   ROM Version                  :
   Serial Number                :
   Uptime                       :
   CPU Utilization              :
   Memory Utilization           :
   VSF link 1                   :
   VSF link 2                   :
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsf link

```
show vsf link
```

### Description

Displays the VSF link state for each member.

### Example

```
switch# show vsf link

VSF Member 1

     Link       Peer    Peer
Link State      Member  Link   Interfaces
---- ---------- ------- ------ ---------------------------
1    up         2       1      1/1/50
2    up         10      2      1/1/49

VSF Member 2

     Link       Peer    Peer
Link State      Member  Link   Interfaces
---- ---------- ------- ------ ---------------------------
1    up         1       1      2/1/49
2    up         3       1      2/1/50

VSF Member 3

     Link       Peer    Peer
Link State      Member  Link   Interfaces
---- ---------- ------- ------ ---------------------------
1    up         2       2      3/1/25
2    up         4       1      3/1/26

VSF Member 4

     Link       Peer    Peer
Link State      Member  Link   Interfaces
---- ---------- ------- ------ ---------------------------
1    up         3       2      4/1/25
2    up         5       1      4/1/26
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsf link detail

`show vsf link detail`

### Description

Shows detailed information of the interfaces configured on links of all stack members.

### Example

```
switch# show vsf link detail

VSF Member: 1  Link 1  Description: link 1 connected to member 2

Port     State     Status Code  Peer Interface  Peer System MAC     Peer Product
Type
-------  --------  -----------  --------------  ------------------  --------------
---
1/1/27   up        S            2/1/27          38:21:c7:5c:e4:c0   JL668A

1/1/28   error     M            1/1/27          38:21:c7:5c:d7:40   JL668A

VSF Member: 2  Link 1  Description: link 1 connected to member 1

Port     State       Status Code  Peer Interface  Peer System MAC     Peer Product
Type
-------  --------  -----------  --------------  ------------------  --------------
---
2/1/27   up        S            1/1/27          38:21:c7:5c:99:80   JL668A

2/1/28   error     T

VSF Member: 2  Link 2  Description: link 2 connected to member 3

Port     State       Status Code  Peer Interface  Peer System MAC     Peer Product
Type
-------  --------  -----------  --------------  ------------------  --------------
---
2/1/25   up        S            3/1/26          38:21:c7:5c:f0:00   JL668A

2/1/26   down      D

VSF Member: 3  Link 1  Description: link 1 in loop

Port     State     Status Code  Peer Interface  Peer System MAC     Peer Product
Type
```

```
-------  --------  -----------  --------------  ------------------  --------------
---
3/1/27   error     L            3/1/28          38:21:c7:5c:f0:00   JL668A

3/1/28   error     L            3/1/27          38:21:c7:5c:f0:00   JL668A

VSF Member: 3  Link 2

Port     State     Status Code  Peer Interface  Peer System MAC     Peer Product
Type
-------  --------  -----------  --------------  ------------------  --------------
---
3/1/25   down      D

3/1/26   up        S            2/1/25          38:21:c7:5c:e4:c0   JL668A

Flag abbreviation:
S   - Success      D - Interface physically down     T   - Peer timed out
L   - Loop detected on the interface                 AP  - Peer autojoin in
progress
P   - Peer with incompatible product type       ANE - Peer is not autojoin
eligible
SV  - Peer with incompatible software version   AF  - Peer autojoin validations
failed
M   - Peer with inconsistent system MAC address
ILC - Peer with inconsistent VSF link configuration
AMS - Peer autojoin failed as it has MACsec configuration
AMI - Peer with multiple VSF interfaces attempting to autojoin
ACM - Peer attempting to autojoin on non-provisioned interface
AND - Peer with non-default VSF interface attempting to autojoin
AID - Peer autojoin failed as it is connected in incorrect direction
AFN - Peer autojoin failed as there is no free member number available
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsf link error-detail

```
show vsf link error-detail
```

### Description

Shows detailed error information of the interfaces configured on links of all stack members. Also, the corrective action is also recommended to recover from the error.

## Example

Showing error information of the interfaces about the loop detection:

```
switch(config)# show vsf link error-detail

VSF Member: 2  Link 1

Port                          : 2/1/27
Status Code                   : L  - `Loop detected on the interface`

Error Description             : There is a loop detected between interfaces 2/1/27
and
                                2/1/28 of member 2 indicating wrong cabling.

Suggested Corrective Action : VSF interfaces 2/1/27 and 2/1/28 are connected back
to
                                back - please fix the cabling.


VSF Member: 2  Link 1

Port                          : 2/1/28
Status code                   : L - `Loop detected on the interface`

Error Description             : There is a loop detected between interfaces 2/1/28
and
                                2/1/27 of member 2 indicating wrong cabling.

Suggested Corrective Action : VSF interfaces 2/1/28 and 2/1/27 are connected back
to
                                back - please fix the cabling.


VSF Member: 10  Link 1

Port                          : 10/1/26
Status Code                   : AFN  - `Peer autojoin failed as there is no free
                                member number available`

Error Description             : Maximum stack size has been reached or there are no
                                free provisioned member entries available matching
the
                                peer switch with product type JL667A.

Suggested Corrective Action : Remove a member using “no vsf member x” CLI and then
                                physically disconnect and reconnect the new switch
                                with product type JL667A for adding it into the
stack.
```

Showing error information when peer member is connected to VSF link via its MACsec-configured interface for autojoin:

```
switch(config)# show vsf link error-detail

VSF Member: 2  Link 2
```

```
Port                           : 2/1/26
Status Code                    : AMS - `Peer autojoin failed as it has MACsec
                                 configuration`

Error Description              : Autojoin failed as interface 2/1/26 is connected to
                                 peer with MAC 38:21:c7:5c:d4:00 on interface 1/1/27
                                 which has MACsec configuration.

Suggested Corrective Action : MACsec configuration should be removed from the
                                 peer with MAC 38:21:c7:5c:d4:00 on interface 1/1/27.
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsf link error-detail member

```
show vsf link error-detail member <MEMBER-ID>
```

### Description

Shows error information and the suggestive action to resolve the error of the interfaces configured on links of a particular stack member.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | VSF member identifier. Required.<br>■ Range for 6300 devices: 1-10. |

### Example

Showing error information and the suggestive action for member 1:

```
switch# show vsf link error-detail member 1

VSF Member: 1  Link 1

Port                           : 1/1/52
```

```
Status Code                  : M - `Peer with inconsistent system MAC address`

Error Description            : All interfaces within a single VSF link must
terminate
                               into the same peer switch. Interface 1/1/52 of
                               member 1 link 1 is connected to a wrong peer with
                               MAC 38:21:c7:5c:26:40.

Suggested Corrective Action : Multiple VSF neighbors detected on this VSF link 1.
                               Interface 1/1/52 is connected to device MAC
                               38:21:c7:5c:26:40. Please make sure the VSF
interfaces
                               of link 1 terminate on the same peer device.
```

Showing error information and the suggestive action for member 4:

```
switch# show vsf link error-detail member 4

VSF Member: 4  Link 1

Port                         : 4/1/27
Status Code                  : AND  - `Peer with non-default VSF interface
attempting
                               to autojoin`

Error Description            : Switch with MAC 38:21:c7:5c:a0:c0 is connected on
port
                               1/1/27 which is a non default autojoin VSF
interface.

Suggested Corrective Action : Auto-join failed on device with MAC
38:21:c7:5c:a0:c0.
                               Please connect this device via interfaces 25 or 26 -
                               those are the auto-join capable interfaces on this
                               device.
```

Showing error information when the peer member is connected to member 2’s VSF link via its MACsec-configured interface for autojoin:

```
switch(config)# show vsf link error-detail member 2

VSF Member: 2  Link 2

Port                         : 2/1/26
Status Code                  : AMS - `Peer autojoin failed as it has MACsec
                               configuration`

Error Description            : Autojoin failed as interface 2/1/26 is connected to
                               peer with MAC 38:21:c7:5c:d4:00 on interface 1/1/27
                               which has MACsec configuration.

Suggested Corrective Action : MACsec configuration should be removed from the
                               peer with MAC 38:21:c7:5c:d4:00 on interface 1/1/27


VSF Member: 2  Link 2

Port                         : 2/1/26
Status Code                  : AMS - `Peer autojoin failed as it has MACsec
```

```
                               configuration`

Error Description            : Autojoin failed as interface 2/1/26 is connected to
                               peer with MAC 38:21:c7:5c:d4:00 on interface 1/1/27
                               which has MACsec configuration.

Suggested Corrective Action : MACsec configuration should be removed from the
                               peer with MAC 38:21:c7:5c:d4:00 on interface 1/1/27
```

Showing output when there is no error-detail for a particular member:

```
switch# show vsf link error-detail member 2
No Error found in member 2
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsf member

`show vsf member <MEMBER-ID>`

### Description

Displays information about the specified VSF member.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | VSF member identifier. Required.<br>■ Range for 6300 devices: 1-10. |

### Example

```
switch# show vsf member 1

Member ID                 : 1
```

```
    MAC Address         : ec:eb:b8:d0:80:40
    Type                : JL557A
    Model               : Aruba JL557A 2930F-48G-740W-PoE+-4SFP Switch
    Status              : Conductor
    ROM Version         : SL.10.02.0000-7755
    Serial Number       : CN7ZK90012
    Uptime              : 0d 0h 18m
    CPU Utilization     : 0%
    Memory Utilization : 15%
    VSF link 1          : Down
    VSF link 2          : Down
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsf topology

```
show vsf topology
```

### Description

Displays information about VSF stack member connections.

### Example

```
switch# show vsf topology

          Stby      Conductor
+---+    +---+    +---+
| 3 |1==2| 2 |1==1| 1 |
+---+    +---+    +---+
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## vsf force-auto-join

`vsf force-auto-join`

### Description

Forces the switch with non-factory default configuration to join a stack. The switch should not have any existing VSF configurations for force auto-join to work. If VSF configurations are made after force auto-join is enabled, the switch will no longer be eligible for auto-join.

### Examples

Forcing a switch with non-factory default configuration to join a stack:

```
switch(config)# vsf force-auto-join
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config` | Administrators or local user group members with execution rights for this command. |

## vsf start-auto-stacking

vsf start-auto-stacking

### Description

Configures the secondary member and VSF links automatically. To use this command, the switch must be in the factory default configuration.

This command is applicable only on the primary switch. The primary switch must be in factory default condition and must not have any VSF configuration.

### Examples

Configuring a VSF secondary member and VSF link on conductor:

```
switch(config)# vsf start-auto-stacking
This will configure links and secondary on conductor

Do you want to continue (y/n)? y
```

Running the configuration on non-factory default switch:

```
switch(config)# vsf start-auto-stacking
The switch is having non-factory default running configuration.
Command is not applicable
```

Running the configuration on non-primary switch:

```
switch(config)# vsf start-auto-stacking
The command is applicable only on Primary switch
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config` | Administrators or local user group members with execution rights for this command. |

## vsf split-detect

```
vsf split-detect <MGMT-INTERFACE>
no vsf split-detect <MGMT-INTERFACE>
```

### Description

Configures the VSF split detection method that specifies the mechanism used for stack fragment discovery when there is a stack split.

Once the stack fragments are discovered, the fragment having the primary member always wins. All non-VSF interfaces on the losing stack fragment will be brought down to minimize network disruption due to duplicate MAC/IP.

The **no** form of this command removes the VSF split detection configuration.

| Parameter | Description |
|---|---|
| *<MGMT-INTERFACE>* | Configures mgmt-interface as the split detection method. Connect the management interfaces of the primary and secondary members to the same L2 network. Optionally, the management interfaces of primary and secondary can be directly connected to each other. |

### Examples

Configuring mgmt-interface as the split detection method:

```
switch(config)# vsf split-detect mgmt
```

Removing split detection from the stack:

```
switch(config)# no vsf split-detect
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | config | Administrators or local user group members with execution rights for this command. |

## vsf secondary-member

```
vsf secondary-member <MEMBER-ID>
no vsf secondary-member <MEMBER-ID>
```

### Description

Configures a secondary member from the available members. The secondary member will normally operate as the Standby member of the stack.

The **no** form of this command removes the configuration of the secondary member.

Member 1 cannot be configured as the secondary member.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | Secondary member number. Required.<br>▪ Range for 6300 devices: 2-10. |

## Examples

Configuring and un-configuring a secondary member:

```
switch(config)# vsf secondary-member 3
This will save the configuration and reboot the specified switch.
Do you want to continue (y/n)? y

switch(config)# no vsf secondary-member
The secondary member will go for a reboot.
Do you want to continue (y/n)? y
```

Configuring a secondary member when secondary member is already configured:

```
switch(config)# vsf secondary-member 3
This will save the configuration and reboot the specified switch.
Do you want to continue (y/n)? y

switch (config)# vsf secondary-member 4
A secondary member is already configured. Existing secondary member
will be unconfigured and rebooted to join the stack as a member. The
specified switch is then rebooted and will join the stack as the new
standby.
Do you want to continue (y/n)? y
```

Configuring a secondary member when one or more members are booting:

```
switch(config)# vsf secondary-member 3
One or more members are currently booting. Allowing this configuration
may cause stack to split leading to traffic disruption.
Do you want to continue (y/n)? y
This will save the configuration and reboot the specified switch.
Do you want to continue (y/n)? y

switch(config)#no vsf secondary-member
One or more members are currently booting. Allowing this configuration
may cause stack to split leading to traffic disruption.
Do you want to continue (y/n)? y
The secondary member will go for a reboot.
Do you want to continue (y/n)? y
```

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config` | Administrators or local user group members with execution rights for this command. |

## vsf renumber-to

`vsf renumber-to <MEMBER-ID>`

### Description

Renumbers VSF member 1 to a value from 2 through 10 (for 6300 devices) and 2 through 8 (for the 6200F device). Changing the member number causes the switch to reboot with the new member number. Only member 1 can be renumbered.

> VSF links must be configured before renumbering a switch. Renumbering will be disallowed if no links are configured or there are provisioned/physically present members.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | Member number to which the member will be renumbered. Required.<br>■ Range for 6300 devices: 2-10. |

### Examples

Renumbering primary VSF member from 1 to 2:

```
switch(config)# vsf renumber-to 2
Member 1 cannot be renumbered until all other members are removed.

switch(config)# vsf renumber-to 2
Member 1 cannot be renumbered until a VSF link is configured.

switch(config)# vsf renumber-to 2
This will save the VSF configuration and reboot the switch.
Do you want to continue (y/n)? y
```

> For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config` | Administrators or local user group members with execution rights for this command. |

## vsf member

```
vsf member <MEMBER-ID>
no vsf member <MEMBER-ID>
```

### Description

Creates VSF member context in the switch for the specified member.

The **no** form of this command removes the specified member from the stack. All configuration associated with the member, as well as the subsystems and interfaces of the member will also be removed.

If the member is physically present in the stack at the time it is removed, it will reboot with the default configuration and lose its identity as a member of the stack from which it was removed.

When a physically present member is removed, it may cause the stack to split.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | VSF member identifier.<br>■ Range for 6300 devices: 1 to 10. |

### Examples

Configuring a VSF member:

```
switch(config)# vsf member 2
switch(vsf-member-2)#
```

Removing a non-conductor member from the stack:

```
switch(config)# no vsf member 2
The specified switch will be unconfigured and rebooted
Do you want to continue (y/n)? y
```

Removing the running conductor should be done with caution as it can make the stack unusable if there is no standby.

For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | `config` | Administrators or local user group members with execution rights for this command. |

## vsf member reboot

`vsf member <MEMBER-ID> reboot`

### Description

Reboots the specified VSF member. Upon reboot, if the conductor is reachable, the member will rejoin the stack.

| Parameter | Description |
|---|---|
| *<MEMBER-ID>* | Member number to be rebooted. Required.<br>■ Range for 6300 devices: 1-10. |

### Examples

Rebooting the primary switch of the stack:

```
switch# vsf member 1 reboot
Rebooting the conductor switch of the stack without a standby
will make the stack unusable.
Do you want to continue (y/n)? y

switch# vsf member 1 reboot
The conductor switch will reboot and the standby will become the conductor.
Do you want to continue (y/n)? y

switch# vsf member 2 reboot
This will reboot the specified switch.
Do you want to continue (y/n)? y
```

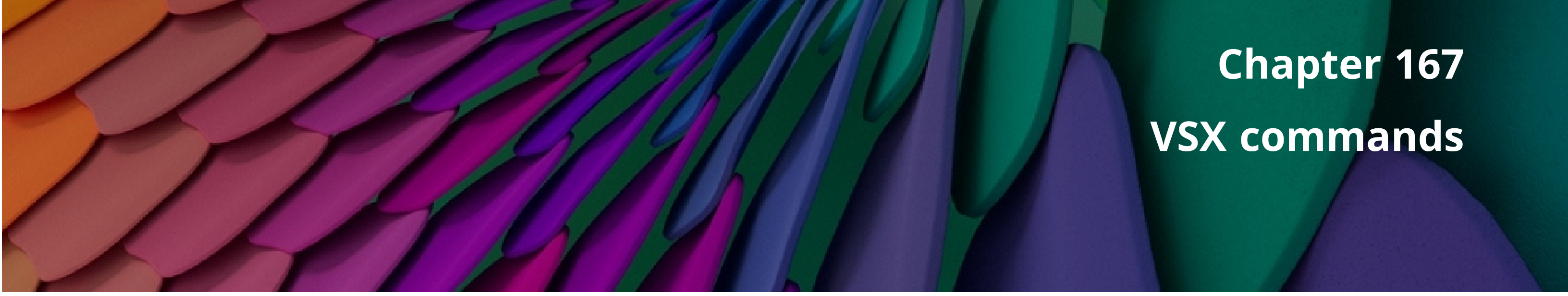
For more information on features that use this command, refer to the Virtual Switching Framework (VSF) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300 | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 167
# VSX commands

VSX commands do not apply to the 6300 series switches.

## active-gateway

```
active-gateway
   ip [<IP-ADDRESS>] [mac <MAC-ADDRESS> [extended-mac]]
   ipv6 [<IPv6-ADDRESS>] [[mac <MAC-ADDRESS> [extended-mac]]
   no ...
```

### Description

Configures a virtual IP and virtual MAC for an interface VLAN. The `extended-mac` option stores MAC addresses in a supplemental table which allows configuring more than 16 virtual MAC addresses.

The **no** form of this command removes the active gateway for active-active routing.

This configuration will disable flow tracking statistics collection.

| Parameter | Description |
|---|---|
| `ip` | Specifies the configuration of an IPv4 address. |
| *<IP-ADDRESS>* | Specifies the IPv4 address. Syntax: **A.B.C.**. |
| *<MAC-ADDR>* | Specifies the Virtual MAC address. Syntax: `xx:xx:xx:xx:xx:xx` |
| `extended-mac` | Stores the MAC address in the extended MAC table. |
| `ipv6` | Specifies the configuration of an IPv6 address. |
| *<IP-ADDRESS>* | Specifies the IPv6 address. Syntax: **A:B::C:D** |
| *<MAC-ADDR>* | Specifies the Virtual MAC address. Syntax: `xx:xx:xx:xx:xx:xx` |
| `extended-mac` | Stores the MAC address in the extended MAC table. |
| `l3-src-mac` | Configures the virtual gateway MAC address as the source MAC for routed packets. |
| `no` | Negates any configured parameter. |

### Usage

Before configuring active gateway, confirm that an IP address is on the SVI that is in the same subnet as the active gateway IP you are trying to configure. If an active gateway IP does not have an SVI IP with the same subnet, the CLI allows the configuration, but the active gateway IP will not be programmed in the kernel, resulting the active gateway to be unreachable.

It is highly recommended that you use an IPv6 link-local address as a gateway (VIP) on the active gateway IPv6 configuration.

If VRRP or active forwarding is configured on an SVI, active gateway cannot be configured. Active gateway with overlapping networks is not allowed. Maximum of 16 unique virtual MACs are supported in a system.

The maximum number of supported active gateways per switch is 4,000. Since a maximum of 31 secondary IPv4 addresses can be configured on an SVI, 32 IPv4 active gateways (along with the primary IPv4 address) can be configured per SVI with IP multinetting support. This support is also the same for IPv6 addresses.

The `extended-mac` option allows you to increase the maximum number of MAC addresses supported in the system. The following are some important points to be considered for using this option:

- The extended-mac feature has some limitations over regular active gateway MACs. Therefore, it is recommended to use the regular active-gateway MACs first.
- Maximum of 500 unique instances, containing the specified active gateway IP and MAC address as a pair can be configured.
- Configuration of `extended-mac` can only be done on VLAN interfaces.
- Extended MAC addresses cannot be one of the 16 MAC addresses in the regular active-gateway table.
- The mac-address matches will only match on the outer destination address of an overlay network packet, making this feature useable only in underlay environments or overlay environments where the L3 gateways using the extended-mac feature are distributed across all VTEPs.
- The `extended-mac` feature is mutually exclusive with the `mac-lockout` feature:
  - If the `mac-lockout` entries are configured, the `extended-mac` configuration will fail .
  - If the `extended-mac` entries are configured, the `mac-lockout` configuration will fail.
  - When both `mac-lockout` and `extended-mac` options are configured through REST API, the `mac-lockout` configuration will take precedence and become the active feature. A log message will be displayed, explaining the conflict.
  - If the `mac-lockout` feature is configured through REST API when the `extended-mac` feature is active, then the `extended-mac` feature will be deactivated.

If the active gateway is configured with the same IP as an SVI IP, then IPv6 DAD cannot be configured and the SVI IP cannot be changed.

The recommended order for configuring an active gateway with the same IPv6 address same as an SVI on both VSX Peers is:

1. IPv6 active gateway configuration
2. SVI IPv6 address configuration

If the configuration is applied in a different order, it may result in a DAD status of DUPLICATE. To remove the DUPLICATE status of the SVI IP address, perform a `shutdown` and `no shutdown` on the interface.

Do not use peer system MAC address as an active-gateway VMAC. If same MAC address is used, the VSX synchronization will try to sync the configuration on secondary switch and cause traffic disruptions.

## Examples

Configuring active-gateway, when the IP address is different from the SVI IP address on both VSX peers (valid for IPv4 and IPv6):

Switch 1:

```
switch1(config-if-vlan)# ip address 192.168.1.250/24
switch1(config-if-vlan)# active-gateway ip 192.168.1.253 mac 00:00:00:00:00:01
switch1(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
```

Switch 2:

```
switch2(config-if-vlan)# ip address 192.168.1.251/24
switch2(config-if-vlan)# active-gateway ip 192.168.1.253 mac 00:00:00:00:00:01
switch2(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
```

Configuring active-gateway when the IP address is the same as the SVI IP address on both VSX peers (valid for IPv4 and IPv6):

Switch 1:

```
switch1(config-if-vlan)# ip address 192.168.1.250/24
switch1(config-if-vlan)# active-gateway ip 192.168.1.250 mac 00:00:00:00:00:01
switch1(config-if-vlan)# active-gateway ipv6 fe80::100 mac 00:00:00:00:00:01
switch1(config-if-vlan)# ipv6 address link-local fe80::100/64
```

Switch 2:

```
switch2(config-if-vlan)# ip address 192.168.1.250/24
switch2(config-if-vlan)# active-gateway ip 192.168.1.250 mac 00:00:00:00:00:01
switch2(config-if-vlan)# active-gateway ipv6 fe80::100 mac 00:00:00:00:00:01
switch2(config-if-vlan)# ipv6 address link-local fe80::100/64
```

Configuring only the active gateway address:

```
switch(config-if-vlan)# ip address 192.168.1.250/24
switch(config-if-vlan)# active-gateway ip 192.168.1.250
```

Configuring only the active gateway IP MAC address:

```
switch2(config-if-vlan)# ip address 192.168.1.250/24
switch2(config-if-vlan)# active-gateway ip mac 00:00:00:01:00:01
```

Configuring the active gateway with the extended MAC usage (IPv4 and IPv6):

```
switch(config-if-vlan)# active-gateway ip mac 00:00:00:00:00:01 extended-mac
Warning: This configuration will disable flow tracking statistics collection.
switch(config-if-vlan)# active-gateway ipv6 mac 00:00:00:00:00:02 extended-mac
Warning: This configuration will disable flow tracking statistics collection.
switch(config-if-vlan)# active-gateway ip 10.0.0.2 mac 00:00:00:00:00:01 extended-
mac
switch(config-if-vlan)# active-gateway ipv6 fe80::100 mac 00:00:00:00:00:01
```

```
extended-macc
```

Removing the active gateway for active-active routing (IPv6 and IPv4):

```
switch(config-if-vlan)# no active-gateway ip
switch(config-if-vlan)# no active-gateway ipv6
```

Removing the active gateway for active-active routing for an IP address:

```
switch(config-if-vlan)# no active-gateway ip 192.168.1.250
```

Removing the active gateway for active-active routing for virtual MAC addresses:

```
switch(config-if-vlan)# no active-gateway ip mac
```

When configuring the virtual active gateway for IPv6 on an SVI, it is recommended to use the same global IPv6 and active gateway IPv6 address. Similarly, if you want to use the IPv6 link-local address for the virtual active gateway then the same address should be configured for both the SVI and the active gateway.

Global IPv6 address:

```
switch(config-if-vlan)# ipv6 address 1001::1/64
switch(config-if-vlan)# active-gateway ipv6 1001::1
switch(config-if-vlan)# active-gateway ipv6 mac 00:00:00:00:aa:01
```

IPv6-Link-Local address:

```
switch(config-if-vlan)# ipv6 address link-local fe80::1/64
switch(config-if-vlan)# active-gateway ipv6 fe80::1
switch(config-if-vlan)# active-gateway ipv6 mac 00:00:00:00:aa:01
```

Configuring l3-src-mac, when only a IPv4 virtual MAC is configured, a IPv4 virtual MAC is used as a source MAC for IPv4 routed packets.

```
switch(config-if-vlan)# ip address 192.168.1.250/24
switch(config-if-vlan)# active-gateway ip 192.168.1.253 mac 00:00:00:00:00:01
switch(config-if-vlan)# active-gateway l3-src-mac
```

Configuring l3-src-mac, when only a IPv6 virtual MAC is configured, a IPv6 virtual MAC is used as a source MAC for IPv6 routed packets.

```
switch(config-if-vlan)# ip address 192.168.1.250/24
switch(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
switch(config-if-vlan)# active-gateway l3-src-mac
```

Configuring l3-src-mac, when both IPv4 and IPv6 virtual MACs are configured, IPv4 virtual MAC is used as source MAC for IPv4 and IPv6 routed packets. It is recommended to use the same virtual MAC when both ipv4 and ipv6 vitrual MACs are configured.

```
switch(config-if-vlan)# ip address 192.168.1.250/24
switch(config-if-vlan)# active-gateway ip 192.168.1.253 mac 00:00:00:00:00:01
switch(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:00:00:01
switch(config-if-vlan)# active-gateway l3-src-mac
```

When ipv4 and ipv6 virtual MACs are same, 8325 and 10000 switches support 512 SVIs. When ipv4 and ipv6 virtual MACs are different, 8325 and 10000 switches support 341 SVIs.

### Configuration table for supported SVIs

| Configuration | Platforms | Supported SVIs |
|---|---|---|
| When the l3-src-mac IPv4 is configured on SVI along with the active-gateway | 8320 | Up to 190 |
| | 8325 and 10000 | Up to 380 |
| | 8360 and 6400 | Up to 384 |
| | 8100 | Up to 256 |
| When the l3-src-mac IPv4 and IPv6 are configured on SVI along with the active-gateway | 8320 | Up to 165 |
| | 8325 and 10000 | Up to 330 |
| | 8360 and 6400 | Up to 384 |
| | 8100 | Up to 256 |
| When the VSX active-forwarding, VRRP and virtual-mac features are configured | 8320, 8325,8360, 8100, 6400, and 10000 | Goes down |

Configuring l3-src-mac, when no virtual MACs are configured, the System MAC is used as source MAC for routed packets. Such configuration can generate a CLI warning as shown.

```
switch(config-if-vlan)# ip address 192.168.1.250/24
switch(config-if-vlan)# active-gateway l3-src-mac
Warning: Active Gateway VMAC is not configured
```

With VSX-Sync configured, "active-gateway l3-src-mac" configuration synces to the peer device. Following configuration from vsx-primary device can get synced to vsx-secondary device.

VSX-Primary-Switch:

```
vsx-pri-switch(config-if-vlan)# ip address 192.168.1.250/24
vsx-pri-switch(config-if-vlan)# active-gateway ip 192.168.1.253 mac
00:00:00:00:00:01
vsx-pri-switch(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
vsx-pri-switch(config-if-vlan)# active-gateway l3-src-mac
```

For VSX-peer devices, without VSX-Sync configured, it is expected that virtual MACs and l3-src-mac configurations are identical on both devices for a given interface VLAN. If configurations don't match, each device may end up using different source MAC for routed traffic for this inteface and connectivity from connected devices to this VSX-peer devices may get affected.

VSX-Primary-Switch:

```
vsx-pri-switch(config-if-vlan)# ip address 192.168.1.250/24
vsx-pri-switch(config-if-vlan)# active-gateway ip 192.168.1.253 mac
00:00:00:00:00:01
vsx-pri-switch(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
vsx-pri-switch(config-if-vlan)# active-gateway l3-src-mac
```

VSX-Secondary-Switch:

```
vsx-sec-switch(config-if-vlan)# ip address 192.168.1.250/24
vsx-sec-switch(config-if-vlan)#
vsx-sec-switch(config-if-vlan)# active-gateway ip 192.168.1.253 mac
00:00:00:00:00:01
vsx-sec-switch(config-if-vlan)# active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
vsx-sec-switch(config-if-vlan)# active-gateway l3-src-mac
```

Configuring l2-vlan-mac-mode flood on a VLAN interface, l3-src-mac cannot be configured. Such configuration can generate an error as shown and command will not take affect.

```
switch(config)# system l2-vlan-mac-mode flood
switch(config-if-vlan)# ip address 192.168.1.250/24
switch(config-if-vlan)# active-gateway l3-src-mac
active-gateway l3-src-mac cannot be configured when l2-vlan-mac-mode flood is
configured.
```

### Configuration table for supported SVIs

| Configuration | Platforms | Supported SVIs |
|---|---|---|
| When flood mode is configured | 8320 | Less than 512 |
| | 8325 and 10000 | Less than 1024 |
| When the active-gateway IPv4 is configured on SVI along with the flood mode | 8320 | Up to 190 |
| | 8325 and 10000 | Up to 380 |
| When the active-gateway IPv4 and IPv6 are configured on SVI along with the flood mode | 8320 | Up to 165 |
| | 8325 and 10000 | Up to 330 |
| When the VSX active-forwarding, VRRP and virtual-mac features are configured | 8320, 8325 and 10000 | Goes down |

When l3-src-mac option is unconfigured, System MAC uses as source MAC for routed traffic.

```
switch(config-if-vlan)# no active-gateway l3-src-mac
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Added information related to role based IPFIX. |
| 10.12.1000 | Added the `extended-mac` feature support for 6400v2, 8100, and 8360v2 switches. |
| 10.12 | The `l3-src-mac` parameter supported for 6400, 8100, and 8360 switches. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-if-vlan` | Administrators or local user group members with execution rights for this command. |

## config-sync disable

```
config-sync disable
no config-sync disable
```

### Description

Pauses VSX synchronization.

The **no** form of this command restarts VSX synchronization.

### Examples

Pauses VSX configuration synchronization:

```
switch(config)# vsx
switch(config-vsx)# config-sync disable
```

Enables the VSX configuration synchronization:

```
switch(config)# vsx
switch(config-vsx)# no config-sync disable
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## inter-switch-link {<*PORT-NUM*> | lag <*LAG-ID*>}

```
inter-switch-link {<PORT-NUM> | lag <LAG-ID>}
no inter-switch-link [lag <LAG-ID>]
```

### Description

Configures a physical port or a LAG as an interswitch link port. Only one port or LAG can be configured to act as an ISL. Once a port is configured as an ISL, it becomes a part of all VLANs in a system.

The **no** form of this command clears the configuration of the interswitch link port from a physical port or a LAG.

| Parameter | Description |
|---|---|
| *<PORT-NUM>* | Specifies a physical port on the switch. Use the format `member/slot/port` (for example, `1/3/1`). Sets the port to act as ISL |
| *<LAG-ID>* | Specifies the LAG ID. Run the `show capacities` command for the maximum number of VSX LAGs supported for your particular type of switch. |

### Examples

Configuring port 1/1/1 as an interswitch link port:

```
switch(config-vsx)# inter-switch-link 1/1/1
```

Configuring LAG 100 as an interswitch link port:

```
switch(config-vsx)# inter-switch-link lag 100
```

Clears the interswitch link port:

```
switch(config-vsx)# no inter-switch-link
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added optional `lag` parameter to the no form of the command. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## inter-switch-link dead-interval

```
inter-switch-link dead-interval <DEAD-INTERVAL>
no inter-switch-link dead-interval
```

### Description

Sets the dead interval for the interswitch link protocol. The dead interval is the amount of time to wait for hellos from a peer before declaring the peer to be dead. The default dead interval time is 20 seconds.

The **no** form of this command resets the interswitch link dead interval to the default of 20 seconds.

| Parameter | Description |
|---|---|
| *`<DEAD-INTERVAL>`* | Specifies the dead interval in seconds. Required. Range: 2 to 20 seconds. |

### Examples

Setting the dead interval for the interswitch link protocol to 10 seconds:

```
switch(config)# vsx
switch(config-vsx)# inter-switch-link dead-interval 10
```

Setting the dead interval for the interswitch link protocol to the default:

```
switch(config)# vsx
switch(config-vsx)# no vsx inter-switch-link dead-interval
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## inter-switch-link hello-interval

```
inter-switch-link hello-interval <HELLO-INTERVAL>
no inter-switch-link hello-interval
```

### Description

Configures the interswitch link hello-interval. The hello interval determines the frequency of a hello packet exchange to confirm the control plane of the peer is alive. The default hello-interval is 1 second.

The **no** form of this command sets the interswitch link hello-interval to the default of 1 second.

| Parameter | Description |
|---|---|
| *<HELLO-INTERVAL>* | Specifies hello interval in seconds. Range: 1 to 5 seconds. |

### Examples

Configuring the interswitch link hello-interval to 3 seconds:

```
switch(config)# vsx
switch(config-vsx)# inter-switch-link hello-interval 3
```

Resetting the interswitch link hello-interval to the default of 1 second:

```
switch(config)# vsx
switch(config-vsx)# no inter-switch-link hello-interval
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# inter-switch-link hold-time

```
inter-switch-link hold-time <HOLD-INTERVAL>
no inter-switch-link hold-time
```

## Description

Sets the holdtime for the interswitch link protocol. A port is treated as down only when it stays down for the configured holdtime interval. The default holdtime is 0 seconds.

The **no** form of this command sets the interswitch link protocol holdtime to the default of 0 seconds.

| Parameter | Description |
|---|---|
| *<HOLD-INTERVAL>* | Specifies the hold interval in seconds. Required. Range: 0 to 3 seconds. |

## Examples

Setting the holdtime for interswitch link protocol to 2 seconds:

```
switch(config)# vsx
switch(config-vsx)# inter-switch-link hold-time 2
```

Setting the interswitch link protocol holdtime to the default of 0 seconds:

```
switch(config)# vsx
switch(config-vsx)# no inter-switch-link hold-time
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# inter-switch-link peer-detect-interval

```
inter-switch-link peer-detect-interval <PEER-DETECT-INTERVAL>
no inter-switch-link peer-detect-interval
```

## Description

Sets the amount of time in seconds that the VSX switch waits for the ISL interface to link up after a reboot. If the ISL link does not come up within this time window, the VSX switch declares itself as split from its peer. The default peer detect interval is 300 seconds.

The **no** form of this command sets the interswitch link protocol peer detect interval to the default of 300 seconds.

| Parameter | Description |
|---|---|
| *<PEER-DETECT-INTERVAL>* | Specifies the peer detect interval in seconds. Required. Range: 60 to 1800 seconds. |

## Usage

After a VSX switch reboots, the switch waits 5 minutes by default to receive a hello packet before it declares itself to be out-of-sync. The `inter-switch-link peer-detect-interval` *<PEER-DETECT-INTERVAL>* command lets you change how long the switch waits to receive the hello packet before the switch declares itself to be out-of-sync.

## Examples

Setting the peer detect interval to 180 seconds:

```
switch(config)# vsx
switch(config-vsx)# inter-switch-link peer-detect-interval 180
```

Restoring the peer detect interval to the default (300 seconds):

```
switch(config)# vsx
switch(config-vsx)# no inter-switch-link peer-detect-interval
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# interface lag multi-chassis

```
interface lag <LAG-ID> multi-chassis [static]
no interface lag <LAG-ID>
```

## Description

Configures a given LAG as a dynamic multichassis LAG (VSX LAG), which supports a maximum of four member links per switch segment. A VSX LAG across a downstream switch can have at most a total of 16 member links.

The **no** form of this command removes a VSX LAG.

| Parameter | Description |
|---|---|
| *<LAG-ID>* | Specifies the LAG ID. Run the `show capacities vsx` command for the maximum number of VSX LAGs supported for your particular type of switch; however, the maximum VSX LAG value considers that one port is used for the ISL, which is not a VSX LAG. Required. |
| `static` | Specifies the multichassis LAG as static. Optional. |

## Usage

A VSX LAG across a VSX pair can have at most a total of 16 interfaces.

- When creating a VSX LAG, select an equal number of member links in each segment for load balancing, such as four member links (one segment) and four member links (another segment). Do not create a VSX LAG with four member links in one switch and two member links on another segment. A switch can have a maximum of four member links.
- Make sure that the VSX LAG interface on both the VSX primary and secondary switches has a member port configured and enabled.
- Make sure that you also have a non-VSX port that is available for the ISL.
- It is recommended to use hashing algorithm value as **l3-src-dst** (default) or **l2-src-dst** on the VSX LAG.

You cannot change the mode of a multichassis LAG without removing the multichassis LAG first. To change a pre-existing VSX LAG to a static VSX LAG, first remove the VSX LAG with the **no interface lag <LAG-ID>** command. Then, enter the **interface lag *<LAG-ID>* multi-chassis static** command.

## Examples

Configuring LAG 100 as a VSX LAG:

```
switch(config)# interface lag 100 multi-chassis
```

Removing LAG 100 as a VSX LAG:

```
switch(config)# no interface lag 100
```

Specifying LAG 100 as a static VSX LAG:

```
switch(config)# interface lag 100 multi-chassis static
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | config | Administrators or local user group members with execution rights for this command. |

## ip icmp redirect

```
ip icmp redirect
no ip icmp redirect
```

### Description

Enables the sending of ICMPv4 and ICMPv6 redirect messages to the source host. Enabled by default.

The **no** form of this command disables ICMPv4 and ICMPv6 redirect messages to the source host.

### Examples

Enabling ICMP redirect messages:

```
switch(config)# ip icmp redirect
```

Disabling ICMP redirect messages:

```
switch(config)# no ip icmp redirect
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

## keepalive dead-interval

```
keepalive dead-interval <DEAD-INTERVAL>
no keepalive dead-interval
```

### Description

Sets the dead-interval for keepalive protocol. The dead interval is the amount of time to wait for hellos from a peer before declaring the peer to be dead. The default dead-interval is 3 seconds.

The **no** form of this command sets the interswitch link dead-interval to the default of 3 seconds.

| Parameter | Description |
|---|---|
| `dead-interval <DEAD-INTERVAL>` | Specifies the dead-interval in seconds. Range: 2 to 20 seconds |

### Examples

Setting the dead-interval for keepalive protocol to 10 seconds:

```
switch(config)# vsx
switch(config-vsx)# keepalive dead-interval 10
```

Setting the dead-interval for keepalive protocol to the default:

```
switch(config)# vsx
switch(config-vsx)# no keepalive dead-interval
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# keepalive hello-interval

```
keepalive hello-interval <HELLO-INTERVAL>
no keepalive hello-interval
```

## Description

Sets the hello-interval for keepalive protocol. The hello interval determines the frequency of a hello packet exchange to confirm the peer is alive. The default hello-interval is 1 second.

The **no** form of this command sets the hello-interval for keepalive protocol to the default of 1 second.

| Parameter | Description |
|---|---|
| `hello-interval <HELLO-INTERVAL>` | Specifies the hello-interval in seconds. Range: 1 to 5 seconds |

## Examples

Setting the hello-interval for keepalive protocol to 3 seconds:

```
switch(config)# vsx
switch(config-vsx)# keepalive hello-interval 3
```

Resetting the hello-interval for keepalive protocol to the default:

```
switch(config)# vsx
switch(config-vsx)# no keepalive hello-interval
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# keepalive peer

```
keepalive peer <PEER-IP-ADDR> source <SOURCE-IP-ADDR> [vrf <VRF-NAME>]
no keepalive [peer <PEER-IP-ADDR> source <SOURCE-IP-ADDR> [vrf <VRF-NAME>]]
```

## Description

Sets the source and peer IP addresses for keepalive packets in a specified VRF. If a VRF is not specified, it sets to the default VRF. Both IPv4 and IPv6 are supported. Source and peer IP addresses for keepalive packets can also be configured on the management VRF.

The **no** form of this command removes the source and peer IP addresses and VRF for the keepalive protocol. VSX continues to work.

| Parameter | Description |
|---|---|
| `peer <PEER-IP-ADDR>` | Specifies the peer IPv4 or IPv6 address. Syntax: A.B.C.D |
| `source <IP-ADDR>` | Specifies the source IPv4 or IPv6 address. The source IP address is the IP address assigned to the keepalive interface on the switch. For example, if you are entering this command on the primary switch, the source IP address would be the IP address assigned to the keepalive interface on the primary switch. Syntax: A.B.C.D |
| `vrf <VRF-NAME>` | Specifies the VRF name. If you are entering this command on the primary switch, the peer IP address is the IP address assigned to the keepalive interface for the secondary switch. If you are entering this command on the secondary switch, the peer IP address is the IP address assigned to the keepalive interface for the primary switch. Syntax: String |

## Usage

To configure the keepalive feature, enter this command once on the primary switch and once on the secondary switch. The keepalive feature is recommended for redundancy. If the ISL link goes down, the keepalive connection keeps the traffic moving so that the peer and secondary switches can continue to communicate. The keepalive connection is established over a routed network, and it does not have to be a dedicated peer-to-peer link unlike ISL.

## Examples

Setting the source and peer IP addresses for keepalive in the default VRF:

```
switch(config)# vsx
switch(config-vsx)# keepalive peer 192.168.1.1 source 192.168.1.5
```

Setting the source and peer IPv6 addresses for keepalive in the default VRF:

```
switch(config)# vsx
switch(config-vsx)# keepalive peer 2002:2 source 2002::3
```

Setting the source and peer IP addresses for keepalive in the vrf1:

```
switch(config)# vsx
switch(config-vsx)# keepalive peer 10.0.0.1 source 10.0.0.2 vrf vrf1
```

Setting the source and peer IP addresses for keepalive in the managament VRF:

```
switch(config)# vsx
switch(config-vsx)# keepalive peer 10.0.0.1 source 10.0.0.2 vrf mgmt
```

Removing the source and peer IP addresses and VRF for the keepalive protocol:

```
switch(config)# vsx
switch(config-vsx)# no keepalive
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added optional parameters to the **no** form of the command. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## keepalive udp-port

```
keepalive udp-port <PORT-NUM>
no keepalive udp-port
```

### Description

Sets the UDP port for the keepalive protocol.

The **no** form of this command sets the UDP port for keepalive protocol to the default of 7678.

| Parameter | Description |
|---|---|
| `udp-port <PORT-NUM>` | Specifies UDP port number. Range: 1024-65535 |

### Examples

Setting the UDP port for keepalive protocol to 2000:

```
switch(config)# vsx
switch(config-vsx)# keepalive udp-port 2000
```

Setting the UDP port for keepalive protocol to the default of 7678:

```
switch(config)# vsx
switch(config-vsx)# no keepalive udp-port
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## lacp fallback

```
lacp fallback
no lacp fallback
```

### Description

Sets LACP fallback on a VSX LAG port. When no LACP partner is detected, the VSX LAG port makes members of the VSX LAG function as nonbonded interfaces. To create a VSX LAG, use the `interface lag multi-chassis` command.

The **no** form of this command sets the VSX LAG to a block state when no LACP partner is detected.

### Usage

LACP fallback is supported only when there is a single link from the downstream or peer device to each VSX node.

Even though this command appears to be accepted on a standard/non-VSX LAG, the fallback feature works only on a VSX LAG (multichassis LAG) interface.

### Examples

Enabling LACP fallback:

```
switch(config)# interface lag 1
switch(config-lag-if)# lacp fallback
```

Disables LACP fallback:

```
switch(config)# interface lag 1
switch(config-lag-if)# no lacp fallback
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-lag-if` | Administrators or local user group members with execution rights for this command. |

## linkup-delay-timer

```
linkup-delay-timer <DELAY-TIMER>
no linkup-delay-timer [<DELAY-TIMER>]
```

### Description

Configures the VSX link-up delay timer. The VSX delay timer feature lets you configure the delay timer, which delays bringing downstream VSX links up, following a VSX device reboot or an ISL flap.

The **no** form of this command restores the VSX link-up delay timer to a default of 180 seconds.

| Parameter | Description |
|---|---|
| *<DELAY-TIMER>* | Specifies the VSX LAG bring-up delay in seconds. Range: 0 to 600 seconds |

### Usage

The recommended delay timer setting is determined by the number of MAC addresses, ARPv4, and routes. The link-up delay timer might need to be set to a higher value for larger networks, depending on the ARP and routing table size.

### Examples

Setting the VSX link-up delay timer to 35 seconds:

```
switch(config)# vsx
switch(config-vsx)# linkup-delay-timer 35
```

Setting the VSX link-up delay timer to the default:

```
switch(config)# vsx
switch(config-vsx)# no linkup-delay-timer
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Added optional *<DELAY-TIMER>* parameter to the **no** form of the command. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## linkup-delay-timer exclude lag-list

```
linkup-delay-timer exclude lag-list <LAG-LIST>
no linkup-delay-timer exclude lag-list <LAG-LIST>
```

### Description

Configures the VSX link-up delay timer exclude list. It excludes the bringing up of specified downstream VSX LAGs, following a device reboot or an ISL flap.

The **no** form of this command unconfigures the VSX link-up delay timer exclude list.

| Parameter | Description |
|---|---|
| *<LAG-LIST>* | Specifies a range or a set of LAG interfaces to exclude. For example: `1` or `1-10` or `1,2,3` or `1,2-10`. Range: 1-128 characters. |

### Examples

Specifying LAGs to exclude LAG 100:

```
switch(config)# vsx
switch(config-vsx)# linkup-delay-timer exclude lag-list 100
```

Unconfiguring the VSX link-up delay timer exclude list for LAG 100:

```
switch(config)# vsx
switch(config-vsx)# no linkup-delay-timer exclude lag-list 100
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## neighbor <IP-ADDRESS> vsx-sync-exclude

`neighbor <IP-ADDRESS> vsx-sync-exclude`

### Description

Excludes VSX sync for the BGP neighbor.

### Examples

Excluding VSX sync for the BGP neighbor:

```
switch(config-bgp)#  neighbor 1.1.1.1 vsx-sync-exclude
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-bgp` | Administrators or local user group members with execution rights for this command. |

## role {primary | secondary}

`role {primary | secondary}`

```
no role
```

### Description

Configures the VSX device role.

The **no** form of this command removes the device role of the switch in VSX and causes the interswitch link to be out-of-sync.

| Parameter | Description |
|---|---|
| `{primary \| secondary}` | Selects the VSX role to either primary or secondary for the device. |

### Usage

VSX has no default role defined for the device. The device role assigns the device as the primary or secondary for VSX synchronization. For ISL to be in-sync, one device in VSX must be configured as the primary and the other device must be configured as the secondary.

### Examples

Setting the VSX role to primary:

```
switch(config)# vsx
switch(config-vsx)# role primary
```

Removing the device role:

```
switch(config)# vsx
switch(config-vsx)# no role
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## show active-gateway

```
show active-gateway [vsx-peer]
```

### Description

Displays the gateway information configured on SVIs, such as:

- Number of active-gateway interface VLANs
- Number of IPv4 active-gateway interface VLANs
- Number of IPv6 active-gateway interface VLANs
- Per virtual MAC address
  - IPv4 reference count and its interface VLANs
  - IPv6 reference count and its interface VLANs

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

```
primary# show active-gateway
Number of active-gateway interface VLANs          : 265
Number of IPv4 active-gateway interface VLANs     : 264
Number of IPv6 active-gateway interface VLANs     : 1
VMAC 00:00:00:01:01:16 :
     IPv4 ref count          : 32
     IPv4 interface VLANs    : vlan192-223
     IPv6 ref count          : 0
     IPv6 interface VLANs    : none
VMAC 00:00:00:01:01:11 :
     IPv4 ref count          : 32
     IPv4 interface VLANs    : vlan32-63
     IPv6 ref count          : 0
     IPv6 interface VLANs    : none
VMAC 00:00:00:01:01:17 :
     IPv4 ref count          : 32
     IPv4 interface VLANs    : vlan224-255
     IPv6 ref count          : 0
     IPv6 interface VLANs    : none
VMAC 00:00:00:01:01:18 :
     IPv4 ref count          : 6
     IPv4 interface VLANs    : vlan256-259,300-301
     IPv6 ref count          : 0
     IPv6 interface VLANs    : none
VMAC 00:00:00:01:01:13 :
     IPv4 ref count          : 32
     IPv4 interface VLANs    : vlan96-127
     IPv6 ref count          : 0
     IPv6 interface VLANs    : none
VMAC 00:00:00:01:01:12 :
     IPv4 ref count          : 32
     IPv4 interface VLANs    : vlan64-95
     IPv6 ref count          : 0
     IPv6 interface VLANs    : none
VMAC 00:00:00:01:01:20 :
     IPv4 ref count          : 1
     IPv4 interface VLANs    : vlan4040
     IPv6 ref count          : 0
     IPv6 interface VLANs    : none
VMAC 00:00:00:01:01:14 :
     IPv4 ref count        : 32
     IPv4 interface VLANs  : vlan128-159
     IPv6 ref count        : 0
     IPv6 interface VLANs  : none
VMAC 00:00:00:01:01:10 :
     IPv4 ref count        : 31
     IPv4 interface VLANs  : vlan1-31
     IPv6 ref count        : 0
     IPv6 interface VLANs  : none
VMAC 00:00:00:01:01:15 :
     IPv4 ref count        : 32
     IPv4 interface VLANs  : vlan160-191
     IPv6 ref count        : 0
     IPv6 interface VLANs  : none
VMAC 00:00:00:03:00:12 :
     IPv4 ref count        : 1
     IPv4 interface VLANs  : vlan2000
     IPv6 ref count        : 1
     IPv6 interface VLANs  : vlan4000
VMAC 00:00:00:01:01:19 :
     IPv4 ref count        : 1
     IPv4 interface VLANs  : vlan4000
     IPv6 ref count        : 0
     IPv6 interface VLANs  : none
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show active-gateway <*IFNAME*>

```
show active-gateway <IFNAME> [vsx-peer]
```

### Description

Displays the gateway information per SVI, such as:

- Active-Gateway IPV4 and its MAC address
- Active-Gateway IPV6 and its MAC address

| Parameter | Description |
|---|---|
| *<IFNAME>* | Specifies the VSX interface name. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

```
switch# show active-gateway vlan2000
Active-gateway IPv4 MAC address           : 00:00:00:01:01:18
Active-gateway IPv4 address
       173.6.1.10
 173.7.1.10
Active-gateway IPv6 MAC address           : 00:00:00:03:00:12
Active-gateway IPv6 address
       173::2
 173::3
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show interface <VLAN-NAME>

`show interface <VLAN-NAME> [vsx-peer]`

### Description

Displays a virtual IPv4/IPv6 and MAC configured for active-active routing.

| Parameter | Description |
|---|---|
| *<VLAN-NAME>* | Specifies the VLAN name. Syntax: string |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not |

| Parameter | Description |
|---|---|
|  | have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

```
switch# show interface vlan100

Interface vlan100 is up
 Admin state is up
 Hardware: Ethernet, MAC Address: 48:0f:cf:af:c1:9e
 IPv4 address 192.168.1.1/24
 IPv4 address 192.168.2.1/24 secondary
    active-gateway ip mac 00:00:00:00:00:01
    active-gateway ip 192.168.1.1
    active-gateway ip 192.168.2.2
    active-gateway ipv6 mac 00:00:00:00:00:01
    active-gateway ipv6 fe80::1

 Statistics                         RX                    TX                 Total
 ------------- -------------------- -------------------- --------------------
 L3 Packets                          8                     2                    10
 L3 Bytes                          812                    80                   892
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show lacp aggregates

`show lacp aggregates [<LAG-NAME>] [vsx-peer]`

### Description

Displays a specified LAG or all configured LAGs along with VSX LAGs.

| Parameter | Description |
|---|---|
| *<LAG-NAME>* | Specifies the LAG name. Optional. Syntax: string |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Displaying all configured LAGs along with VSX LAGs:

```
switch# show lacp aggregates

Aggregate name   : lag100 (multi-chassis)
Interfaces       : 1/1/44
Peer interfaces  : 1/1/44
Heartbeat rate   : Slow
Hash             : l3-src-dst
Aggregate mode   : Active
```

Displaying a specified LAG:

```
switch# show lacp aggregates lag100

Aggregate name   : lag100 (multi-chassis)
Interfaces       : 1/1/44
Peer interfaces  : 1/1/44
Heartbeat rate   : Slow
Hash             : l3-src-dst
Aggregate mode   : Active
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show lacp interfaces

`show lacp interfaces [<IFNAME>] [vsx-peer]`

### Description

Displays an LACP configuration of the physical interfaces, including VSXs. If an interface name is passed as argument, it only displays an LACP configuration of a specified interface.

| Parameter | Description |
|---|---|
| *<IFNAME>* | Optional: Specifies an interface name. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

This example displays an LACP configuration of the physical interfaces. One of the interfaces has the `lacp-block` forwarding state. If a VSX switch has loop protect enabled on an interface and a loop occurs, VSX blocks the interface to stop the loop. The forwarding state of the blocked interface is set to `lacp-block`.

```
switch# show lacp interfaces
State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
----------------------------------------------------------------------------------
--
Intf   Aggr    Port    Port   State   System-id          System  Aggr Forwarding
       name    id      Pri                               Pri     Key  State
----------------------------------------------------------------------------------
--
1/1/1  lag10   17      1      ALFOE   70:72:cf:37:a3:5c  20      10   lacp-block
1/1/2  lag128  69      1      ALFNCD  70:72:cf:37:a3:5c  20      128  up
1/1/3  lag128  14      1      ALFNCD  70:72:cf:37:a3:5c  20      128  up
1/1/4  lag128                                                         down
1/1/5  lag20                                                          up

Partner details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggr    Partner Port     State     System-id       System   Aggr
       name    Port-id Pri                                Priority Key
------------------------------------------------------------------------------
1/1/1  lag10   0       65534    PLFOEX  00:00:00:00:00:00 65534    0
1/1/2  lag128  69      1        PLFNCD  70:72:cf:8c:60:a7 65534    128
1/1/3  lag128  14      1        PLFNCD  70:72:cf:8c:60:a7 65534    128
1/1/4  lag128
1/1/5  lag20
```

Displaying static LAG:

```
switch# show lacp interfaces
State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
```

```
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggr   Port    Port   State   System-id         System  Aggr Forwarding
       Name   Id      Pri                              Pri     Key  State
------------------------------------------------------------------------------
1/1/1  lag10                                                        up
1/1/2  lag10                                                        up

Partner details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggr   Port    Port   State   System-id         System  Aggr
       Name   Id      Pri                              Pri     Key
------------------------------------------------------------------------------
1/1/1  lag10
1/1/2  lag10
```

Displaying an LACP configuration of the 1/1/1 interface:

```
switch# show lacp interfaces 1/1/1

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state


Aggregate-name : lag1
-------------------------------------------------
                       Actor             Partner
-------------------------------------------------
Port-id            | 28                 | 31
Port-priority      | 1                  | 1
Key                | 1                  | 1
State              | ALFNCD             | ALFNCD
System-id          | 98:f2:b3:68:40:a0  | 98:f2:b3:68:60:a6
System-priority    | 65534              | 65534
```

Displaying an LACP configuration after loop-protect is enabled on the primary VSX switch:

```
switch# show lacp interfaces

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr Forwarding
        Name       Id    Pri                             Pri    Key  State
------------------------------------------------------------------------------
1/4/14  lag1(mc)   206   1     ALFNCD  f8:60:f0:06:49:00 65534  1    up
1/5/15  lag2(mc)                                                     down

```

```
Partner details of all interfaces:
------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr
        Name       Id    Pri                             Pri    Key
------------------------------------------------------------------------------
1/4/14  lag1(mc)   130   1     ALFNCD  f8:60:f0:06:87:00 65534  1
1/5/15  lag2(mc)
```

Displaying an LACP configuration after loop-protect is enabled on the secondary VSX switch:

```
switch# show lacp interfaces

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

Actor details of all interfaces:
------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr Forwarding
        Name       Id    Pri                             Pri    Key  State
------------------------------------------------------------------------------
1/3/2   lag1(mc)   1130  1     ALFNCD  f8:60:f0:06:49:00 65534  1    up
1/9/3   lag2(mc)                                                     down


Partner details of all interfaces:
------------------------------------------------------------------------------
Intf    Aggr       Port  Port  State   System-ID         System Aggr
        Name       Id    Pri                             Pri    Key
------------------------------------------------------------------------------
1/3/2   lag1(mc)   131   1     ALFNCD  f8:60:f0:06:87:00 65534  1
1/9/3   lag2(mc)
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show lacp interfaces multi-chassis

```
show lacp interfaces multi-chassis [<IFNAME>] [vsx-peer]
```

## Description

Shows all configured VSX remote interface details. The interface that has the ALFNCD status has been synced with the partner and is ready for flow distribution.

| Parameter | Description |
|---|---|
| *<IFNAME>* | Specifies the VSX interface name. Optional. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

```
switch# show lacp interfaces multi-chassis

State abbreviations :
A - Active        P - Passive      F - Aggregable I - Individual
S - Short-timeout L - Long-timeout N - InSync     O - OutofSync
C - Collecting    D - Distributing
X - State m/c expired              E - Default neighbor state

 Actor details of all interfaces:
------------------------------------------------------------------------------
Intf    Aggregate  Port    Port     State   System-ID          System   Aggr
        name       id      Priority                            Priority Key
 ------------------------------------------------------------------------------
1/1/2   lag100(mc) 2       1        ALFNCD  08:00:09:13:06:7c  65534    100


 Partner details of all interfaces:
------------------------------------------------------------------------------
Intf    Aggregate  Partner Port     State   System-ID          System   Aggr
        name       Port-id Priority                            Priority Key
 ------------------------------------------------------------------------------
1/1/2   lag100(mc) 2       1        ALFNCD  08:00:09:05:24:f6  65534    10


 Remote Actor details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggregate  Port    Port     State   System-ID          System   Aggr
       name       id      Priority                            Priority Key
 ------------------------------------------------------------------------------
1/1/2  lag100(mc) 1002    1        ALFNCD  08:00:09:13:06:7c  65534    100


 Remote Partner details of all interfaces:
------------------------------------------------------------------------------
Intf   Aggregate  Partner Port     State   System-ID          System   Aggr
       name       Port-id Priority                            Priority Key
 ------------------------------------------------------------------------------
1/1/2  lag100(mc) 3       1        ALFNCD  08:00:09:05:24:f6  65534    10
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show running-config interface

`show running-config interface`

### Description

Displays all configured interface commands, including VSX commands.

### Example

```
switch# show running-config interface
interface lag 100 multi-chassis
    no shutdown
    no routing
    lacp mode active
interface 1/1/1
    no shutdown
    no routing
interface 1/1/2
    no shutdown
    lag 100
interface 1/1/3
    no shutdown
    ip address 192.168.1.2/24
interface vlan100
    no shutdown
    ip address 192.168.1.1/24
    active-gateway ip 192.168.1.253 mac 00:00:00:00:00:01
    active-gateway ipv6 fe80::01 mac 00:00:00:01:00:01
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show running-config vsx

`show running-config vsx`

## Description

Displays the configured VSX commands.

## Example

```
switch# show running-config vsx
vsx
    system-mac 10:00:00:00:00:01
    inter-switch-link hello-interval 2
    inter-switch-link dead-interval 3
    inter-switch-link hold-time 3
    inter-switch-link peer-detect-interval 300
    role primary
    keepalive udp-port 1500
    keepalive hello-interval 2
    keepalive dead-interval 4
    keepalive peer 192.168.1.1 source 192.168.1.2
    inter-switch-link 1/1/43
interface lag 100 multi-chassis
   no shutdown
   no routing
   vlan access 1
   lacp mode active
interface 1/1/44
   no shutdown
   lag 100
interface vlan2
   ip address 10.0.0.2/24
   vsx-sync active-gateways
   active-gateway ip mac 00:aa:bb:dd:ee:ff
   active-gateway ip 10.0.0.1
   ipv6 address 2000:0:0:1::1/64
   ipv6 address 3000:0:0:1::1/64
   active-gateway ipv6 mac 00:aa:aa:aa:aa:ab
   active-gateway ipv6 2000:0:0:1::3
   active-gateway ipv6 3000:0:0:1::3
interface vlan3
   ipv6 address link-local fe80::100/64
   active-gateway ip mac 00:aa:bb:dd:ee:ff
   active-gateway ip 10.0.0.1
   active-gateway ipv6 mac 00:aa:aa:aa:aa:ab
   active-gateway ipv6 fe80::100
interface vlan4
   active-gateway ip mac 00:aa:bb:dd:ee:ff
   active-gateway ip 10.0.0.1
interface vlan5
   vsx active-forwarding
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09.0010 | Command will now display results for configurations where the active gateway and SVI share the same IPv6 address. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show running-config vsx-sync

```
show running-config vsx-sync
```

### Description

Displays the lines of running-configuration that VSX configuration synchronization is enabled on. The command also provides a rolled-up view of configuration expected to be synced. This command can be run from the primary or secondary peer.

### Example

Displaying the running configuration on which VSX synchronization is enabled:

```
switch# show running-config vsx-sync
Current vsx-sync configuration:
vlan 3
    vsx-sync
access-list ip test1
    vsx-sync
    !
policy test2
    vsx-sync
    !
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show running-config vsx-sync peer-diff

```
show running-config vsx-sync peer-diff
```

## Description

Displays the difference between the configuration of features enabled for VSX synchronization on the primary and secondary switches.

## Usage

Use this command for diagnosing errors. This command provides visibility into which configuration lines did not synchronize from the primary peer to the secondary peer. This command can be run from the primary or secondary peer. The output is displayed in the GNU diff unified format.

## Example

Displaying the running configuration on which VSX synchronization is enabled:

```
switch# show running-config vsx-sync peer-diff
--- /tmp/running-config-vsx.83e 2018-05-01 17:03:38.083281976 +0000
+++ /tmp/peer-running-config-vsx.83e    2018-05-01 17:03:38.077281976 +0000
@@ -1,4 +0,0 @@
-access-list ip sync
-    vsx-sync
-    !
-    10 permit any any any
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show system l2-vlan-mac-mode

```
show system l2-vlan-mac-mode
```

## Description

This command displays the L2 VLAN MAC Mode configuration and status.

| Parameter | Description |
|---|---|

## Examples

Following example shows L2 VLAN MAC Mode configuration.

```
switch# show system l2-vlan-mac-mode
Configured L2 VLAN MAC mode: flood
Operational L2 VLAN MAC mode: flood
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show vsx active-forwarding

```
show vsx active-forwarding [interface <INTERFACE-VLAN>] [vsx-peer]
```

## Description

Shows all the VSX active-forwarding configured interface VLANs or the VSX active-forwarding peer information for a particular interface VLAN.

| Parameter | Description |
|---|---|
| `interface <INTERFACE-VLAN>` | Specifies the interface VLAN name. Syntax: string |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Displaying a list of VSX active-forwarding enabled interfaces:

```
switch# show vsx active-forwarding
List of VSX active-forwarding enabled interfaces:
vlan30
vlan32
vlan33
```

Displaying the VSX active-forwarding peer information for `vlan30`:

```
switch# show vsx active-forwarding interface vlan30
Interface vlan30 has VSX active-forwarding enabled.
Interface vlan30 Peer Data:
Peer MAC: 94:f1:28:21:22:00
Peer IPv6 Addresses:
    fe80::96f1:28ff:fe21:2200
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show vsx brief

`show vsx brief [vsx-peer]`

## Description

Displays the brief VSX status.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Usage

The `show vsx brief` command displays the ISLP device protocol states under the "Device State" heading.

**Table 1:** *ISLP device protocol states*

| Device state | Definition |
|---|---|
| Peer-Established | The VSX switch is in a steady state. VSX LAGs are up. |
| Sync-Primary | ISL connectivity to the peer VSX switch is restored, and the VSX switch is syncing states to the peer VSX switch. VSX LAGs are up. |
| Sync-Secondary | ISL connectivity to the peer VSX switch is restored, and the VSX switch is learning states from the peer VSX switch. VSX LAGs are down. |
| Sync-Secondary-Linkup-Delay | The VSX switch has learned its states from the peer VSX switch, and the VSX switch is monitoring for hardware to be programmed. VSX LAGs are down. |
| Split-System-Primary | The VSX switch has lost ISL connectivity to the peer VSX switch. The VSX switch is operating as the primary VSX switch. VSX LAGs are up. |
| Split-System-Secondary | The VSX switch has lost ISL connectivity to the peer VSX switch. The VSX switch is operating as the secondary VSX switch. VSX LAGs are down. |
| Waiting-For-Peer | The VSX switch is waiting for connectivity to the peer VSX switch. |

## Example

Displaying the brief VSX status for the switch you are logged into:

```
vsx-primary# show vsx brief
ISL State                              : In-Sync
Device State                           : Peer-Established
Keepalive State                        : Keepalive-Established
Device Role                            : primary
Number of Multi-chassis LAG interfaces : 2
```

Displaying the brief VSX status for the peer (secondary) switch while entering the command on the primary switch:

```
vsx-primary# show vsx brief vsx-peer
ISL State                              : In-Sync
Device State                           : Peer-Established
Keepalive State                        : Keepalive-Established
```

```
Device Role                               : secondary
Number of Multi-chassis LAG interfaces : 2
```

Displaying the brief VSX status for the peer (primary) switch while entering the command on the secondary switch:

```
vsx-secondary# show vsx brief vsx-peer
ISL State                                 : In-Sync
Device State                              : Peer-Established
Keepalive State                           : Keepalive-Established
Device Role                               : primary
Number of Multi-chassis LAG interfaces : 2
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show vsx config-consistency

```
show vsx config-consistency [vsx-peer]
```

## Description

Displays the VSX global configuration consistency between two VSX switches.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

The following example shows a comparison between the two VSX switches.

~~~
switch# show vsx config-consistency
Configurations                          Local                             Peer
------------------                      ------                            ------
software version                        0.1.0                             0.1.0
ISL hello interval                      1                                 1
ISL dead interval                       5                                 5
ISL hold interval                       0                                 0
ISL peer detect interval                300                               300
Keepalive hello interval                1                                 1
Keepalive dead interval                 3                                 3
Keepalive UDP port                      7678                              7678
System MAC                              10:00:00:00:00:01
10:00:00:00:00:01

VSX VLAN List
-------------
Local ISL VLANs : 1,100
Peer ISL VLANs  : 1,10

VSX Active Forwarding
---------------------
Interface VLANs      : 2, 5-9
Peer Interface VLANs : 2, 5-10

STP Configurations                      Local                             Peer
------------------                      ------                            ------
STP Enabled                             True                              True
STP Mode                                rpvst-auto                        rpvst-
auto
MST Config Name                         10:00:00:00:00:01
10:00:00:00:00:01
MST Config Revision                     0                                 0
MST Config Digest                       -                                 -
MST hello time(in seconds)              2                                 2
MST maximum age(in seconds)             20                                20
MST maximum hops                        20                                20
MST number of instances                 -                                 -

RPVST VLAN List:
----------------
Local: 2,5-9
Peer : 2,5-9

```
~~~

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show vsx config-consistency lacp

```
show vsx config-consistency lacp [<LAG-NAME>] [vsx-peer]
```

## Description

Displays VSX LACP configuration consistency between two VSX switches.

| Parameter | Description |
|---|---|
| *<LAG-NAME>* | Specifies the LAG name. Optional. Syntax: string |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

```
switch# show vsx config-consistency lacp
Configurations                          Local                  Peer
------------------                      ------                 ------
Name                                    lag100                 lag100
Loop protect enabled                    false                  true
Hash scheme                             l2-src-dst-hash        l2-src-dst-hash
Qos cos override                        0                      0
Qos dscp override                       0                      0
Qos trust

VSX VLAN list
1
Peer VSX VLAN list
1,10

STP link-type                          point-to-point       point-to-point
STP port-type                          admin-network        admin-network
STP bpdu-filter                        Disabled             Disabled
STP bpdu-guard                         Disabled             Disabled
STP loop-guard                         Disabled             Disabled
STP root-guard                         Disabled             Disabled
STP tcn-guard                          Disabled             Disabled


Configurations                          Local                  Peer
------------------                      ------                 ------
Name                                    lag111                 lag111
Loop protect enabled                    false                  false
Hash scheme                             l2-src-dst-hash        l2-src-dst-hash
Qos cos override                        0                      0
Qos dscp override                       0                      0
Qos trust
VSX VLAN list
```

```
1
Peer VSX VLAN list
1

STP link-type                          point-to-point       point-to-point
STP port-type                          admin-network        admin-network
STP bpdu-filter                        Disabled             Disabled
STP bpdu-guard                         Disabled             Disabled
STP loop-guard                         Disabled             Disabled
STP root-guard                         Disabled             Disabled
STP tcn-guard                          Disabled             Disabled
------------------------------------------------------
```

```
switch (config-if-vlan)# show traffic-insight test monitor-type dns-average-
latency mon2
                           error-statistics
Name                               : mntr2
Type                               : dns-average-latency
Start time for error monitoring    : 10/10/2022 04:12:13.923691 UTC
End time for error monitoring      : 10/10/2022 04:17:13.964505 UTC
client_mac        dns_server_ip     number_of_       dns_name  dns_server_   dns_
format_
                                   dns_failures     _errors     failures
errors
----------------------------------------------------------------------------------
------
aa:aa:aa:aa:aa:aa   172.0.0.1           200           50        100
50
bb:bb:bb:bb:bb:bb   172.1.1.1           50            10         20
20
cc:cc:cc:cc:cc:cc   172.2.2.2           150           75         25
50
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsx configuration

```
show vsx configuration {inter-switch-link | keepalive} [vsx-peer]
```

## Description

Displays the ISL configuration or keepalive protocol configuration in VSX.

| Parameter | Description |
|---|---|
| `{inter-switch-link \| keepalive}` | Selects `inter-switch-link` or `keepalive`. |
| `inter-switch-link` | Displays the ISL configuration in VSX. |
| `keepalive` | Displays the keepalive protocol configuration in VSX. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Displaying the ISL configuration in VSX:

```
switch# show vsx configuration inter-switch-link
Inter Switch Link     : 1/1/43
Hello Interval        : 1 Seconds
Dead Interval         : 20 Seconds
Hold Time             : 0 Seconds
Peer detect interval : 300 Seconds
System MAC            : 10:00:00:00:00:01
Device Role           : primary
Multichassis LAGs     : lag100
```

Displaying the keepalive protocol configuration in VSX:

```
switch# show vsx configuration keepalive
Keepalive Interface      : 1/1/1
Keepalive VRF            : test1
Source IP Address        : 192.168.1.1
Peer IP Address          : 192.168.1.2
UDP Port                 : 7678
Hello Interval           : 1 Seconds
Dead Interval            : 3 Seconds
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show vsx configuration split-recovery

```
show vsx configuration split-recovery [vsx-peer]
```

### Description

Displays the state of the split recovery mode.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

```
switch# show vsx configuration split-recovery
Split Recovery Mode    : Enabled
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show vsx ip data-path

```
show vsx ip data-path [<IP-ADDR> | <IP-ADDR>/<MASK>] [vrf <VRF-NAME>] [vsx-peer]
```

### Description

Displays the datapath of the IPv4 route present on local and VSX peer devices.

| Parameter | Description |
|---|---|
| *<IP-ADDR>* \| *<IP-ADDR>/<MASK>*] | Selects one of the following: *<IP-ADDR>* or *<IP-ADDR>/<MASK>* |
| *<IP-ADDR>* | Specifies the datapath for an IPv4 address based on the parameters provided. |
| *<IP-ADDR>/<MASK>* | Specifies the datapath for an IPv4 address and its specified subnet. Optional. Syntax: A.B.C.D/M |
| vrf *<VRF-NAME>* | Shows the IPv4 datapath for a specified VRF. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Example

Displaying the datapath on a VSX switch for 192.0.2.0:

```
switch# show vsx ip data-path 192.0.2.0

IPv4 Data Path Information For 192.0.2.0

Local Device
------------
Route : 192.0.2.0/32
    Egress L3 Interface : 1/1/2
    Next Hop MAC Address    : 08:00:09:ea:d7:d1
    Egress Port    : 1/1/2

    Egress L3 Interface : 1/1/3
    Nexthop Hop MAC Address    : 08:00:09:8e:59:1d
    Egress Port    : 1/1/3

Peer Device
------------
Route : 192.0.2.0/32
    Egress L3 Interface : loopback1
```

Displaying the datapath on a VSX switch for 198.51.100.0/32:

```
switch# show vsx ip data-path 198.51.100.0/32

IPv4 Data Path Information For 198.51.100.0/32

Local Device
------------
Route : 198.51.100.0/32
    Egress L3 Interface : 1/1/4
```

Displaying the datapaths on a VSX switch for 198.51.100.1:

```
switch# show vsx ip data-path 198.51.100.1

IPv4 Data Path Information For 198.51.100.1
```

```
Local Device
------------
Route : 198.51.100.1/32
    Egress L3 Interface : 1/1/4

Peer Device
------------
Route : 198.51.100.0/24
    Egress L3 Interface : 1/1/2
    Next Hop MAC Address   : 08:00:09:db:21:e8
    Egress Port   : 1/1/2
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# show vsx ip route

`show vsx ip route [<IP-ADDR> | <IP-ADDR>/<MASK> | unique] [vrf <VRF-NAME> | all-vrfs] [vsx-peer]`

## Description

Displays a specified LAG or all configured LAGs along with VSX LAGs.

| Parameter | Description |
|---|---|
| `<IP-ADDR> \| <IP-ADDR>/<MASK> \| unique]` | Selects one of the following: `<IP-ADDR>`, `<IP-ADDR>/<MASK>`, or `unique` |
| `<IP-ADDR>` | Specifies the route information for an IPv4 address based on the parameters provided. |
| `<IP-ADDR>/<MASK>` | Specifies the route information for an IPv4 address and its specified subnet. Optional. Syntax: A.B.C.D/M |
| `unique` | Specifies routes that are present only on the primary switch or only on the secondary switch. The routes that are present on both the primary and secondary switch |

| Parameter | Description |
|---|---|
| | are excluded. Optional. Syntax string. |
| `vrf <VRF-NAME> \| all-vrfs` | Selects the VRF name or all VRFs. |
| `<VRF-NAME>` | Shows the IPv4 route information for a specified VRF. |
| `all-vrf` | Shows the IPv4 route information for all VRFs. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Displaying IPv4 routes on a VSX switch:

```
switch# show vsx ip route

IPv4 Forwarding Routes

'[x/y]' denotes [distance/metric]

192.0.2.0/32, vrf default
    via  192.0.2.1,  [1/0],  static on vsx1
    via  192.0.2.2,  [1/0],  static on vsx2
```

Displaying IPv4 routes on a VSX switch:

```
switch# show vsx ip route

IPv4 Forwarding Routes

'[x/y]' denotes [distance/metric]

192.0.2.3/24, vrf default
    via  1/1/3,  [0/0],  connected on vsx1
    via  192.0.2.2,  [110/2],  ospf on vsx2
192.0.2.4/32, vrf default
    via  1/1/3,  [0/0],  local on vsx1
192.0.2.5/24, vrf default
    via  1/1/4,  [0/0],  connected on vsx1
    via  192.0.2.2,  [110/3],  ospf on vsx2
192.0.2.6/32, vrf default
    via  1/1/4,  [0/0],  local on vsx1
192.0.2.7/32, vrf default
    via  192.0.2.8,  [110/1],  ospf on vsx1
    via  192.0.2.1,  [110/1],  ospf on vsx1
    via  loopback1,  [0/0],  local on vsx2
```

Displaying IPv4 unique routes on a VSX switch:

```
switch# show vsx ip route unique
```

```
IPv4 Forwarding Routes

'[x/y]' denotes [distance/metric]

192.0.2.0/32, vrf default
    via  192.0.2.2,  [1/0],  static on vsx2
192.0.2.9/32, vrf default
    via  192.0.2.1,  [1/0],  static on vsx1
```

Displaying IPv4 routes on a VSX switch for 192.0.2.10:

```
switch# show vsx ip route 192.0.2.10

IPv4 Forwarding Routes

'[x/y]' denotes [distance/metric]

192.0.2.10/32, vrf default
    via  192.0.2.1,  [1/0],  static on vsx1
    via  192.0.2.2,  [1/0],  static on vsx2
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsx ipv6 data-path

```
show vsx ipv6 data-path [<IPv6-ADDR> | <IPv6-ADDR>/<MASK>] [vrf <VRF-NAME>] [vsx-peer]
```

### Description

Displays the datapath of the IPv6 route on local and peer VSX devices.

| Parameter | Description |
|---|---|
| *<IPV6-ADDR>* \| *<IPV6-ADDR>/<MASK>*] | Selects one of the following: *<IPV6-ADDR>* or *<IPV6-ADDR>/<MASK>* |

| Parameter | Description |
|---|---|
| *<IPV6-ADDR>* | Specifies the datapath for an IPv6 address based on the parameters provided. |
| *<IPV6-ADDR>/<MASK>* | Specifies the datapath for an IPv6 address and its specified subnet. Optional. Syntax: A.B.C.D/M |
| `vrf` *<VRF-NAME>* | Shows the IPv6 datapath for a specified VRF. |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Displaying an IPv6 datapath on a VSX switch:

```
switch# show vsx ipv6 data-path 1000::

IPv6 Data Path Information For 1000::

Local Device
------------
Route : 1000::/64
    Egress L3 Interface : 1/1/2

Peer Device
------------
Route : 1000::/64
    Egress L3 Interface : 1/1/2
```

Displaying an IPv6 datapath on a VSX switch:

```
switch# show vsx ipv6 data-path 2000::
IPv6 Data Path Information For 2000::

Local Device
------------
Route : 2000::/64
    Egress L3 Interface : 1/1/2
    Next Hop MAC Address   : 08:00:09:0e:0c:1b
    Egress Port   : 1/1/2
```

Displaying IPv6 datapath for 3000::/64 on a VSX switch:

```
switch# show vsx ipv6 data-path 3000::/64
IPv6 Data Path Information For 3000::/64

Local Device
------------
Route : 3000::/64
    Egress L3 Interface : 1/1/2
    Next Hop MAC Address   : 08:00:09:0e:0c:1b
    Egress Port   : 1/1/2
IPv6 Data Path Information For 3000::/64
```

```
Local Device
------------
Route : 3000::/64
    Egress L3 Interface : 1/1/2
    Next Hop MAC Address    : 08:00:09:0e:0c:1b
    Egress Port    : 1/1/2
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsx ipv6 route

```
show vsx ipv6 route [<IPv6-ADDR> | <IPv6-ADDR>/<MASK> | unique]
     [vrf <VRF-NAME> | all-vrfs] [vsx-peer]
```

### Description

Displays a specified LAG or all configured LAGs along with VSX LAGs.

| Parameter | Description |
|---|---|
| `<IPV6-ADDR> \| <IPV6-ADDR>/<MASK> \| unique]` | Selects one of the following: `<IPV6-ADDR>`, `<IPV6-ADDR>/<MASK>`, or `unique` |
| `<IPV6-ADDR>` | Specifies the route information for an IPv4 address based on the parameters provided. |
| `<IPV6-ADDR>/<MASK>` | Specifies the route information for an IPv4 address and its specified subnet. Optional. Syntax: A.B.C.D/M |
| `unique` | Specifies routes that are present only on the primary switch or only on the secondary switch. The routes that are present on both the primary and secondary switch are excluded. Optional. Syntax string. |
| `vrf <VRF-NAME> \| all-vrfs` | Selects the VRF name or all VRFs. |

| Parameter | Description |
|---|---|
| *<VRF-NAME>* | Shows the IPv4 route information for a specified VRF. |
| all-vrf | Shows the IPv4 route information for all VRFs. |
| vsx-peer | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Examples

Displaying IPv6 routes on a VSX switch:

```
switch# show vsx ipv6 route

IPv6 Forwarding Routes

'[x/y]' denotes [distance/metric]

1000::/64, vrf default
    via  1/1/2,   [0/0],  connected on vsx1
    via  1/1/2,   [0/0],  connected on vsx2
1000::1/128, vrf default
    via  1/1/2,   [0/0],  local on vsx1
```

Displaying IPv6 unique routes on a VSX switch:

```
switch# show vsx ipv6 route unique
IPv6 Forwarding Routes

'[x/y]' denotes [distance/metric]

1000::1/128, vrf default
    via  1/1/2,   [0/0],  local on vsx1
1000::2/128, vrf default
    via  1/1/2,   [0/0],  local on vsx2
3000::/64, vrf default
    via  1000::2,   [1/0],  static on vsx1
```

Displaying IPv6 routes on a VSX switch for 2000::/64:

```
switch# show vsx ipv6 route 2000::/64
IPv6 Forwarding Routes

'[x/y]' denotes [distance/metric]

2000::/64, vrf default
    via  1000::2,   [1/0],  static on vsx1
    via  1000::1,   [1/0],  static on vsx2
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsx status

```
show vsx status [inter-switch-link | keepalive | linkup-delay] [vsx-peer]
```

### Description

Displays global VSX status or a specified status determined by the selected parameter.

| Parameter | Description |
|---|---|
| `[inter-switch-link \| keepalive \| linkup-delay]` | Selects one of the following: `inter-switch-link`, `keepalive`, or `linkup-delay` |
| `inter-switch-link` | Specifies the display of the ISL status in VSX. |
| `keepalive` | Specifies the display of the VSX keepalive protocol status. |
| `linkup-delay` | Specifies the display of the VSX link-up delay information, such as the:<br>■ Configured link-up delay timer.<br>■ Delay timer status.<br>■ Initial sync status.<br>■ LAGs on which the delay timer is running.<br>■ Status of the LAGs excluded from the link-up delay timer.<br>■ Interfaces that are shut down during VSX split.<br>■ Interfaces that are shut down during VSX split |
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Examples

Displaying the global VSX status:

```
switch# show vsx status
VSX Operational State
---------------------
  ISL channel             : In-Sync
  ISL mgmt channel        : operational
  Config Sync Status      : in-sync
  NAE                     : peer_reachable
  HTTPS Server            : peer_reachable


Attribute           Local                       Peer
------------        --------                    --------
ISL link            1/1/43                      1/1/43
ISL version         2                           2
System MAC          48:0f:cf:af:70:84           48:0f:cf:af:c2:84
Platform            8320                        8320
Software Version    10.0x.xxxx                  10.0x.xxxx
Device Role         primary                     secondary
```

Displaying the ISL status in VSX:

```
switch# show vsx status inter-switch-link
State                     : In-Sync
Link Status               : up
Mgmt state                : operational

Inter-switch link Statistics
----------------------------
Hello Packets Tx          : 4572
Hello Packets Rx          : 4573
Data Packets Tx           : 80634
Data Packets Rx           : 80637
Mgmt Packets Tx           : 25946
Mgmt Packets Rx           : 25167
Mgmt Packet Drops         : 0
```

Displaying the VSX keepalive protocol status:

```
switch# show vsx status keepalive
Keepalive State           : Keepalive-Established
Last Established          : Thu Jun  8 09:03:01 2018
Last Failed               : Thu Jun  8 09:04:02 2018
Peer System Id            : 58:1f:cf:af:a0:84
Peer Device Role          : primary

Keepalive Counters
Keepalive Packets Tx      : 322
Keepalive Packets Rx      : 121
Keepalive Timeouts        : 0
Keepalive Packets Dropped : 14
```

Displaying the VSX link-up delay status while ARP/MAC VSX synchronization is in progress:

```
switch# show vsx status linkup-delay

Configured linkup delay-timer                                : 180 seconds
Initial sync status                                          : In-progress
```

```
Delay timer status                                           : Waiting-to-start
Linkup Delay time left                                       :
Interfaces that will be brought up after delay timer expires : lag20,lag30-lag31
Interfaces enabled for shutdown-on-split that will be brought
up after the delay timer expires                             :
Interfaces that are excluded from delay timer                : lag2
```

Displaying the VSX link-up delay status with ARP/MAC VSX synchronization completed with the delay timer running:

```
switch# show vsx status linkup-delay

Configured linkup delay-timer                                : 180 seconds
Initial sync status                                          : Completed
Delay timer status                                           : Running
Linkup Delay time left                                       : 1 minutes 22
seconds
Interfaces that will be brought up after delay timer expires : lag20,lag30-lag31
Interfaces enabled for shutdown-on-split that will be brought
up after the delay timer expires                             :
Interfaces that are excluded from delay timer                : lag2
```

Displaying the VSX link-up delay status with ARP/MAC VSX synchronization completed and the delay timer expired:

```

```

Displaying the global VSX status for the peer switch:

```
vsx-primary# show vsx status vsx-peer
VSX Operational State
---------------------
  ISL channel             : In-Sync
  ISL mgmt channel        : operational
  Config Sync Status      : in-sync
  NAE                     : peer_reachable
  HTTPS Server            : peer_reachable

Attribute           Local               Peer
------------        --------            --------
ISL link            lag1                lag1
ISL version         2                   2
System MAC          e0:07:1b:cb:72:e4   98:f2:b3:68:79:2e
Platform            8320                8320
Software Version    10.0x.xxxx          10.0x.xxxx
Device Role         secondary           primary
```

Displaying the status for an out-of-sync status for VSX.

```
switch# show vsx status linkup-delay

Configured linkup delay-timer                                : 20 seconds
Initial sync status                                          :
Delay timer status                                           :
Linkup Delay time left                                       :
```

```
Interfaces that will be brought up after delay timer expires :
Interfaces enabled for shutdown-on-split that will be brought
up after the delay timer expires                             :
Interfaces that are excluded from delay timer                :
```

Displaying the status VSX link-up delay status when interfaces enabled for shutdown-on-split.

```
switch# show vsx status linkup-delay
Configured linkup delay-timer                                : 180 seconds
Initial sync status                                          : In-progress
Delay timer status                                           : Waiting-to-start
Linkup Delay time left                                       :
Interfaces that will be brought up after delay timer expires : lag8,lag256
Interfaces enabled for shutdown-on-split that will be brought
up after the delay timer expires                             : 1/1/27,1/1/37,
                                                               vlan2-vlan57
Interfaces that are excluded from delay timer                :
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsx status config-sync

```
show vsx status config-sync [vsx-peer]
```

### Description

Displays VSX configuration synchronization status for peers. This command can be run from the primary or secondary peer to view the configuration synchronization state.

| Parameter | Description |
|---|---|
| `vsx-peer` | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

### Example

```
switch# show vsx status config-sync
Admin State                : Enabled
Operational State          : Operational
Error State                : None
Recommended remediation : N/A
Current Time               : Wed Jul 18 23:41:07 2018
Last Sync Time             : Wed Jul 18 23:38:26 2018
```

The Admin State parameter can be configured individually on each of the switches on the VSX pair. Hence difference in values does not imply a failure.

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsx status peering

```
show vsx status peering
```

### Description

Displays synchronization peering status and hardware peering status for modules such as MAC, neighbor, spanning-tree, and route. This command can be used to view the status of VSX peering, following a VSX device reboot or an ISL flap.

Following are the possible values for VSX peering status:

- **Complete**—VSX peering process is successfully completed.
- **In-progress**—VSX peering is being processed.
- **Not-started**—VSX peering process is yet to be started.

### Examples

Displaying the VSX peering status :

```
switch# show vsx status peering
----------------------------------------------------------------
```

```
Module             Sync-Status       Hardware-Status
-----------------------------------------------------------------
MAC                In-progress       Not-started
Neighbor           Complete          In-progress
Route              Complete          Complete
Spanning-tree      In-progress       Not-started
EVPN               In-progress       Not-started
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show vsx status shutdown-on-split

```
show vsx status shutdown-on-split
```

### Description

Displays the status of the interfaces that are shut down during a VSX split.

You can also use `show interface` command to view the status of the interface. For example, assume that you have shut down the non-vsx interface 1/1/2 during the VSX split. When you enter `show interface` command on the secondary switch, the output from the command indicates that the interface was blocked by VSX feature.

### Examples

Displaying the status of interfaces that are shut down during the VSX split:

```
switch(config)# show vsx status shutdown-on-split
List of non-vsx interfaces enabled for split shutdown and its status.

Interfaces                    Status
1/1/1                        Disabled
lag100                       Disabled
vlan2                        Disabled
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## split recovery

```
split-recovery
no split-recovery
```

### Description

Enables split recovery mode. Split recovery mode is enabled by default.

The **no** form of this command disables split-recovery mode.

### Usage

Split recovery mode prevents traffic loss when the ISL goes out-of-sync and keepalive subsequently fails. When the ISL goes out-of-sync and keepalive is established, the secondary VSX LAGs are brought down. If keepalive then also fails, this situation causes a split condition. In this case, if split recovery mode is enabled, the secondary switch restores its VSX LAGs so they are up.

When split recovery mode is disabled during a split condition, the secondary switch keeps it VSX LAGs down.

### Examples

Enabling split recovery mode:

```
switch(config-vsx)# split-recovery
```

Disabling split recovery mode:

```
switch(config-vsx)# no split-recovery
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## system l2-vlan-mac-mode

```
system l2-vlan-mac-mode {drop|flood}
no system l2-vlan-mac-mode {drop|flood}
```

### Description

This command configures the forwarding action for packets received on an l2 VLAN port when switch system MAC address as the destination MAC address.

The **no** form of this command configures the switch to the default setting of dropping packets.

| Parameter | Description |
|---|---|
| `drop` | Forwarding action of the packets is to drop. (default) |
| `flood` | Forwarding action of the packets is to flood. |

When flood mode is configured, 8320 and 8325 or 10000 switches support less than 512 and 1024 SVIs respectively. When the active-gateway is configured on SVI along with the flood mode, it supports up to 10 SVIs.

### Examples

The following example for flood the packets:

```
switch(config)# system l2-vlan-mac-mode flood
```

The following example for drop the packets:

```
switch(config)# system l2-vlan-mac-mode drop
```

The Following example for packets default setting:

```
switch(config)# no system l2-vlan-mac-mode
```

The Following example for default setting of system l2-vlan-mac-mode drop command:

```
switch(config)# no system l2-vlan-mac-mode drop
```

The Following example for default setting of system l2-vlan-mac-mode flood command:

```
switch(config)# no system l2-vlan-mac-mode flood
```

Configuring l3-src-mac on a VLAN interface, l2-vlan-mac-mode flood cannot be configured. Such configuration can generate an error as shown and command will not take affect.

```
switch(config-if-vlan)# active-gateway l3-src-mac
switch(config)# system l2-vlan-mac-mode flood
l2-vlan-mac-mode flood cannot be configured when active-gateway l3-src-mac is
configured.
```

### Configuration table for supported SVIs

| Configuration | Platforms | Supported SVIs |
|---|---|---|
| When flood mode is configured | 8320 | Less than 512 |
| | 8325 and 10000 | Less than 1024 |
| When the active-gateway IPv4 is configured on SVI along with the flood mode | 8320 | Up to 190 |
| | 8325 and 10000 | Up to 380 |
| When the active-gateway IPv4 and IPv6 are configured on SVI along with the flood mode | 8320 | Up to 165 |
| | 8325 and 10000 | Up to 330 |
| When the VSX active-forwarding, VRRP and virtual-mac features are configured | 8320, 8325 and 10000 | Goes down |

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

# system-mac

```
system-mac <MAC-ADDR>
no system-mac [<MAC-ADDR>]
```

## Description

Sets the MAC address as the VSX system MAC address to be used by control plane protocols, such as STP and LACP. A pair of VSX switches must have the same VSX system MAC.

The **no** form of this command unconfigures the VSX system MAC address to be used by control plane protocols.

| Parameter | Description |
|---|---|
| *<MAC-ADDR>* | Specifies the MAC address in a colon separated format, such as XX:XX:XX:XX:XX:XX, for control plane protocols. |

## Usage

The **system-mac <*MAC-ADDR*>** command is highly recommended for preventing traffic disruptions when the primary VSX switch restores after the secondary VSX switch, such as during:

- A primary switch hardware replacement.
- A power outage with the primary switch restore after the secondary switch restore.

When the primary switch is restored after the secondary switch, a traffic disruption might occur when the ISL starts to sync. This situation occurs because the MAC system address changes from the secondary switch to the primary switch for the LACP. To avoid the traffic disruption, set the common system MAC address by entering the **system-mac <MAC-ADDR>** command. This command creates a common system MAC address between the two VSX switches. This common system MAC address prevents a traffic disruption when the secondary switch comes up before the primary switch. If the common system MAC access is enabled, the secondary switch uses the common system MAC address instead of its own system MAC address, which prevents a traffic loss.

The system MAC address also maintains the same MSTP bridge ID across VSX switches, which act as a single switch.

## Examples

Setting a MAC address as the VSX system MAC address to be used by control plane protocols:

```
switch(config-vsx)# system-mac 02:01:00:00:01:00
```

Unconfiguring a VSX system MAC address to be used by control plane protocols:

```
switch(config-vsx)# no system-mac 02:01:00:00:01:00
```

Null system MAC address such as 00:00:00:00:00:00 is not allowed.

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.08 | Updated **no** form of the command. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## VSX

```
vsx
no vsx
```

### Description

Creates the VSX context on the switch.

The **no** form of this command disables the VSX context on the switch and removes all related configuration settings.

### Examples

Creating the VSX context on the switch:

```
switch(config)# vsx
switch(config-vsx)#
```

Removing the VSX context and all VSX configuration settings from the switch:

```
switch(config-vsx)# no vsx
VSX configuration will be deleted.
Do you want to continue (y/n)? y
switch(config)#
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config` | Administrators or local user group members with execution rights for this command. |

# vsx active-forwarding

```
vsx active-forwarding
no vsx active-forwarding
```

## Description

Configures VSX active-forwarding on an interface VLAN.

The **no** form of this command unconfigures VSX active-forwarding on a VLAN interface.

## Usage

Active forwarding cannot be configured when ICMP redirect is enabled. The ICMP redirect setting is global not per SVI. Enter the `no ip icmp redirect` command for disabling ICMP redirect at the `switch (config)#` prompt.

If a system has active forwarding enabled, an active gateway can have a maximum of 14 "unique" MAC addresses per system, including IPv4 and IPv6 addresses.

If a system has active forwarding disabled, an active gateway can have a maximum of 16 "unique" MAC addresses per system, including IPv4 and IPv6 addresses.

## Examples

Successfully enabling VSX active-forwarding:

```
switch# interface vlan 3
switch(config-if-vlan)# vsx active-forwarding
switch(config-vsx)#
```

Unconfiguring VSX active-forwarding:

```
switch# interface vlan 3
switch(config-if-vlan)# no vsx active-forwarding
switch(config-vsx)#
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-if-vlan` | Administrators or local user group members with execution rights for this command. |

# vsx shutdown-on-split

```
vsx shutdown-on-split
no vsx shutdown-on-split
```

## Description

Shuts down the configured non-VSX interfaces on the VSX secondary along with VSX interfaces during a VSX split.

The **no** form of this command resumes the non-VSX interfaces that are shut down during the VSX split.

This command has no effect on the VSX primary during a split. However, when applied on the VSX primary, the command will bring down the non-VSX interfaces until linkup delay timer expires during the VSX primary reboot.

## Examples

Shutting down the non-VSX interface 1/1/1during the VSX split:

```
switch(config)# interface 1/1/1
switch(config-if)# vsx shutdown-on-split
switch(config)# interface lag 1
witch(config-lag-if)# vsx shutdown-on-split
```

Shutting down the non-VSX interface LAG 5 during the VSX split:

```
switch(config)# interface lag 5
switch(config-lag-if)# vsx shutdown-on-split
```

Shutting down the non-VSX SVI during the VSX split:

```
switch(config)# interface vlan 2
switch(config-if-vlan)# vsx shutdown-on-split
```

Resuming the non-VSX interface that are shutdown during the VSX split:

```
switch(config-if)# no vsx shutdown-on-split
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-if`<br>`config-lag-if`<br>`config-if-vlan` | Administrators or local user group members with execution rights for this command. |

## vsx-sync

```
vsx-sync
no vsx-sync
```

### Description

Enables VSX synchronization for the entire context for the following features from the primary VSX node to the secondary peer switch:

- Access list context
- Classifier context
- Object group context
- Policy-based routing profile context
- Policy context
- QoS queue profile context
- QoS schedule profile context
- VLAN context

The **no** form of this command disables VSX synchronization for the entire context for a feature, but it does not remove the feature configurations from the secondary peer. Any subsequent configuration changes made under the specific configuration context are not synchronized to the secondary peer switch.

### Usage

Make sure that you are in the correct context for the feature that you are trying to enable VSX synchronization:

| Feature context for enabling VSX synchronization | Command for accessing correct context for the `vsx-sync` command* |
|---|---|
| Access list context for an ACL type, such as IPv4, IPv6, or MAC. | access-list *<ACL-TYPE>* *<ACL-NAME>* |
| Class context for a class type, such as IPv4, IPv6, or MAC. | class *<CLASS-TYPE>* *<CLASS-NAME>* |
| Object group context for IPv4 | object-group ip address *<OBJECT-GROUP-NAME>* |

| Feature context for enabling VSX synchronization | Command for accessing correct context for the `vsx-sync` command* |
|---|---|
| Object group context for IPv6 | `object-group ipv6 address` *<OBJECT-GROUP-NAME>* |
| Object group context for ports | `object-group port` *<OBJECT-GROUP-NAME>* |
| Policy-based routing profile context | `pbr` *<ACTION-LIST-NAME>* |
| Policy context | `policy` *<POLICY-NAME>* |
| QoS queue profile context | `qos queue-profile` *<QUEUE-PROFILE-NAME>* |
| QoS schedule profile context | `qos schedule-profile` *<SCHEDULE-PROFILE-NAME>* |
| VLAN context | `vlan` *<ID>* |

*The commands listed in this column are entered at the `switch(config)#` prompt, as shown in the following examples.

## Examples

Enabling VSX synchronization for this IPv4 access list context to the secondary peer:

```
switch(config)# access-list ip ITBoston
switch(config-acl-ip)# vsx-sync
```

Enabling VSX synchronization for this IPv6 access list context to the secondary peer:

```
switch(config)# access-list ipv6 ITRoseville
switch(config-acl-ipv6)# vsx-sync
```

Enabling VSX synchronization for this MAC access list context to the secondary peer:

```
switch(config)# access-list mac ITBangalore
switch(config-acl-ipv6)# vsx-sync
```

Enabling VSX synchronization for this IPv4 class context to the secondary peer:

```
switch(config)# class ip ITengineering
switch(config-class-ip)# vsx-sync
```

Enabling VSX synchronization for this object group context for IPv4:

```
switch(config)# object-group ip address group1
switch(config-addrgroup-ip)# 1.1.1.1
switch(config-addrgroup-ip)# vsx-sync
```

Enabling VSX synchronization for this QoS queue profile context to the secondary peer:

```
switch(config)# qos queue-profile test_queue_profile
switch(config-queue)# vsx-sync
```

Enabling VSX synchronization for this QoS schedule profile context to the secondary peer:

```
switch(config)# qos schedule-profile test_queue_profile1
switch(config-schedule)# vsx-sync
```

Enabling VSX synchronization for this PBR profile context to the secondary peer:

```
switch(config)# pbr engineering
switch(config-pbr-action-list-engineering)# vsx-sync
```

Enabling VSX synchronization for this policy context to the secondary peer:

```
switch(config)# policy ITPaloAlto
switch(config-policy)# vsx-sync
```

Enabling VSX synchronization for this VLAN context to the secondary peer:

```
switch(config)# vlan 1
switch(config-vlan-1)# vsx-sync
```

Disabling VSX synchronization for this IPv4 class context to the secondary peer:

```
switch(config)# class ip ITengineering
switch(config-class-ip)# no vsx-sync
```

Disabling VSX synchronization for this object group context for IPv4:

```
switch(config)# object-group ip address group1
switch(config-addrgroup-ip)# no vsx-sync
```

Disabling VSX synchronization for this QoS queue profile context to the secondary peer:

```
switch(config)# qos queue-profile test_queue_profile
switch(config-queue)# no vsx-sync
```

Disabling VSX synchronization for this QoS schedule profile context to the secondary peer:

```
switch(config)# qos schedule-profile test_queue_profile1
switch(config-schedule)# no vsx-sync
```

Disabling VSX synchronization for this PBR profile context to the secondary peer:

```
switch(config)# pbr engineering
switch(config-pbr-action-list-engineering)# no vsx-sync
```

Disabling VSX synchronization for this policy context to the secondary peer:

```
switch(config)# policy ITPaloAlto
switch(config-policy)# no vsx-sync
```

Disabling VSX synchronization for this MAC access list context to the secondary peer:

```
switch(config)# access-list mac ITBangalore
switch(config-acl-ipv6)# no vsx-sync
```

Disabling VSX synchronization for this VLAN context to the secondary peer:

```
switch(config)# vlan 1
switch(config-vlan-1)# no vsx-sync
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-acl-`*`<ACL-TYPE>`*<br>`config-addrgroup-ip`<br>`config-addrgroup-ipv6`<br>`config-class-`*`<CLASS-TYPE>`*<br>`config-policy`<br>`config-portgroup`<br>`config-pbr-action-list-`*`<ACTION-LIST-NAME>`*<br>`config-queue`<br>`config-schedule-`*`<NAME>`*<br>`config-vlan-`*`<VLAN-ID>`* | Administrators or local user group members with execution rights for this command. |

# vsx-sync (config-if, config-lag-if contexts)

```
vsx-sync {[access-lists] [qos] [rate-limits] [vlans] [policies] [irdp] [portfilter]
[private-vlan port-type] [dhcp-snooping]}
no vsx-sync {[access-lists] [qos] [rate-limits] [vlans] [policies] [irdp] [portfilter]
[private-vlan port-type] [dhcp-snooping]}
```

### Description

Enables VSX synchronization for the following for a logical interface or a LAG instance:

- Access lists
- IRDP configurations
- QoS
- Rate limits
- Port filter configurations
- VLAN associations
- PVLAN port type configurations
- DHCP snooping

This command enables VSX synchronization for individual associations and to the combination of associations to the interface context. To synchronize the associations, you must configure the same interface on the peer switch.

When enabling VSX synchronization under a physical interface, under a VLAN interface, or a VSX LAG, create on the secondary switch the physical interface, VLAN interface, or VSX LAG with the same name and routing setting as on the primary switch. For example, if the primary switch has a physical interface of 1/1/1, you must create another physical interface of 1/1/1 on the secondary switch. Also, if the primary VSX switch has routing enabled, the secondary switch must have routing enabled. Once the name and routing information is the same, VSX synchronization synchronizes the additional configuration information from the primary VSX switch to the secondary VSX switch.

The **no** form of this command disables VSX synchronization, but it does not remove the feature configurations from the secondary peer.

| Parameter | Description |
|---|---|
| `{[access-lists] [qos] [rate-limits] [vlans] [policies] [irdp] [portfilter] [private-vlan port-type] [dhcp-snooping]}` | Specifies one or more of the features for which to enable VSX synchronization. |
| `access-lists` | Specifies the access lists that are associated under the interface enabled for VSX syncing. |
| `qos` | Specifies the QoS associated under the interface enabled for VSX syncing. |
| `rate-limits` | Specifies the rate limits that are associated under the interface enabled for VSX syncing. |
| `vlans` | Specifies the VLANs that are associated under the interface enabled for VSX syncing. |
| `policies` | Specifies the classifier |

| Parameter | Description |
|---|---|
| | policies that are associated under the interface enabled for VSX syncing. |
| `irdp` | Specifies the Internet Router Discovery Protocol (IRDP) configurations that are associated under the interface enabled for VSX syncing. |
| `portfilter` | Specifies the port filter configurations that are associated under the interface enabled for VSX syncing. |
| `private-vlan port-type` | Specifies the PVLAN port type configurations that are associated under the interface enabled for VSX syncing. |
| `dhcp-snooping` | Specifies the DHCP snooping configuration parameters that are associated under the interface enabled for VSX syncing. |

## Example

Enabling VSX synchronization for VLANs associated with logical interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# vsx-sync vlans
```

Enabling VSX synchronization for access lists associated with logical interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# vsx-sync access-lists
```

Enabling VSX synchronization for access lists and policies that are associated with logical interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# vsx-sync access-lists policies
```

Enabling VSX synchronization for VLANs and QoS that are associated under logical interface 1/1/5:

```
switch(config)# interface 1/1/5
switch(config-if)# vsx-sync vlans qos
```

Enabling VSX synchronization for rate limits that are associated under logical interface 1/1/5:

```
switch(config)# interface 1/1/5
switch(config-if)# vsx-sync rate-limits
```

Enabling VSX synchronization for rate limits, VLANs, QoS, access lists, policies associated with logical interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# vsx-sync rate-limits vlans qos access-lists policies
```

Enabling VSX synchronization for VLAN 1 under interface LAG 1:

```
switch(config)# interface lag 1
switch(config-lag-if)# vsx-sync vlans
switch(config-lag-if)# vlan trunk native 1
```

Enabling VSX synchronization for an access list under interface LAG 2:

```
switch(config)# interface lag 2
switch(config-lag-if)# vsx-sync access-lists
switch(config-lag-if)# apply access-list ip test1 in
```

Enabling VSX synchronization for a QoS under interface LAG 3:

```
switch(config)# interface lag 3
switch(config-lag-if)# vsx-sync qos
switch(config-lag-if)# apply qos schedule-profile test
```

Enabling VSX synchronization for a rate limit under interface LAG 4:

```
switch(config)# interface lag 4
switch(config-lag-if)# vsx-sync rate-limits
switch(config-lag-if)# rate-limit broadcast 23 kbps
```

Enabling VSX synchronization for a policy named test under interface LAG 5:

```
switch(config)# interface lag 5
switch(config-lag-if)# vsx-sync policies
switch(config-lag-if)# apply policy test in
```

Enabling VSX synchronization for a policy named test1, a rate limit of 23 kbps, a QoS named test, VLAN 1, and an access list named test1 under interface LAG 6:

```
switch(config)# interface lag 6
switch(config-lag-if)# vsx-sync policies rate-limits qos vlans access-lists
switch(config-lag-if)# apply policy test1 in
switch(config-lag-if)# rate-limit broadcast 23 kbps
switch(config-lag-if)# apply qos schedule-profile test
switch(config-lag-if)# vlan trunk native 1
switch(config-lag-if)# apply access-list ip test 1 in
```

Enabling VSX synchronization for a port filter:

```
switch(config)# interface 1/1/1
switch(config-if)# vsx-sync portfilter
```

```
switch(config)# interface lag 1
switch(config-lag-if)# vsx-sync portfilter
```

Enabling VSX synchronization for a PVLAN port type configuration under interface LAG 3:

```
switch(config)# interface lag 3
switch(config-lag-if)# vsx-sync private-vlan-port-type
```

Enabling VSX synchronization for DHCP snooping configuration under interface LAG 9:

```
switch(config)# interface lag 9 multi-chassis
switch(config-lag-if)# vsx-sync dhcp-snooping
```

Disabling VSX synchronization for DHCP snooping configuration under interface LAG 9:

```
switch(config)# interface lag 9 multi-chassis
switch(config-lag-if)# no vsx-sync dhcp-snooping
```

Disabling VSX synchronization for access lists and policies under logical interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# no vsx-sync access-lists policies
```

Disabling VSX synchronization for access lists and policies under interface LAG 2:

```
switch(config)# interface lag 2
switch(config-if)# no vsx-sync access-lists policies
```

Enabling VSX synchronization of IRDP configurations under logical interface 1/1/1. The first five lines in the example configure IRDP and the last line enables VSX synchronization for IRDP configurations associated under interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# ip irdp
switch(config-if)# ip irdp minadvertinterval 550
switch(config-if)# ip irdp maxadvertinterval 850
switch(config-if)# ip irdp holdtime 900
switch(config-if)# vsx-sync irdp
```

Disabling VSX synchronization for a PVLAN port type configuration under interface LAG 8:

```
switch(config)# interface lag 8
switch(config-lag-if)# no vsx-sync private-vlan-port-typeno vsx-sync private-vlan-
```

```
port-type
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.09 | Added `private-vlan-port-type` parameter. Updated examples. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-if`<br>`config-lag-if` | Administrators or local user group members with execution rights for this command. |

## vsx-sync (config-vlan-if context)

```
vsx-sync {[active-gateways] [policies]}
no vsx-sync {[active-gateways] [policies]}
```

### Description

Enables VSX sync of active gateways or policies associated under an interface. To synchronize the associations, you must configure the same `interface vlan` on the peer switch.

The **no** form of this command removes VSX synchronization for active gateways or policies associated under an interface, but it does not remove the feature configurations from the secondary peer switch.

| Parameter | Description |
|---|---|
| `{[active-gateways] [policies]}` | Specifies one or more of the features for which to enable VSX synchronization. |
| `access-gateways` | Specifies that active gateways associated with an interface are enabled for VSX syncing. |
| `policies` | Specifies that policies associated with an interface are enabled for VSX syncing. |

### Usage

Configure an SVI on the secondary switch; however, you do not need to run the `vsx-sync active-gateways` command on the secondary VSX switch.

Do not use peer system MAC address as an active-gateway VMAC. If same MAC address is used, the VSX synchronization will try to sync the configuration on secondary switch and cause traffic disruptions.

### Examples

Enabling VSX synchronization for an active gateway associated with VLAN 1:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# vsx-sync active-gateways
```

Enabling VSX synchronization for policies associated with VLAN 1:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# vsx-sync policies
```

Enabling VSX synchronization for active gateways and policies associated with VLAN 1:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# active-gateway ip 10.10.10.10 mac 23:24:25:26:27:28
switch(config-if-vlan)# active-gateway ipv6 fd12:3456:789a:1::1 mac
fd12:3456:789a:1::1 23:24:25:26:27:28
switch(config-if-vlan)# vsx-sync active-gateways policies
```

Disabling VSX synchronization for active gateways associated with VLAN 1:

```
switch(config)# interface vlan 1
switch(config-if-vlan)# no vsx-sync active-gateways
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-if-vlan` | Administrators or local user group members with execution rights for this command. |

## vsx-sync aaa

```
vsx-sync aaa
no vsx-sync aaa
```

### Description

Enables VSX synchronization of all AAA configurations, including user, RADIUS server, and TACACS+ server, on the primary VSX node to the secondary peer switch.

The **no** form of this command removes VSX synchronization of global AAA configurations, but it does not remove the existing global AAA feature configurations from the secondary peer switch.

### Examples

Enabling VSX sync for the AAA configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# vsx-sync aaa
```

Disabling VSX sync for the AAA configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync aaa
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync acl-log-timer

```
vsx-sync acl-log-timer
no vsx-sync acl-log-timer
```

### Description

Enables VSX synchronization of access list log timer configurations on the primary VSX node to the secondary peer.

The **no** form of this command removes VSX synchronization of access list log timer configurations to the secondary peer. However, it does not remove the previously synced configurations from the secondary peer switch.

### Examples

Enabling VSX sync for the access list log timer configurations:

```
switch(config)# access-list log timer 30
switch(config)# vsx
switch(config-vsx)# vsx-sync acl-log-timer
```

Disabling VSX sync for the access list log timer configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync acl-log-timer
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync acl-secure-update

```
vsx-sync acl-secure-update
no vsx-sync acl-secure-update
```

### Description

If this setting is enabled and the primary VSX node has configurations with the access list secure-update feature enabled,  this configuration can synchronize to the secondary peer. This setting is disabled by default.

The **no** form of the command disables the syncing of access list secure-update configurations to the secondary peer, but that does not remove any existing access list secure-update feature configurations from the secondary peer.

### Examples

Enabling VSX sync for configurations with the access list secure-update feature:

```
switch(config)# vsx
switch(config-vsx)# vsx-sync acl-secure-update
```

Disabling VSX sync for configurations with the access list secure-update feature:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync acl-secure-update
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Related Commands

| Command | Description |
|---|---|
| `access-list secure-update` | This command determines if access lists are updated using the secure-update feature. Secure-update is enabled by default. Refer to the *ACLs and Classifiers Policy Guide* for details. |

### Command History

| Release | Modification |
|---|---|
| 10.13 | Command Introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync arp-security

```
vsx-sync arp-security
no vsx-sync arp-security
```

### Description

Enables VSX synchronization of the ARP security configurations on the primary VSX switch to the secondary peer switch. After you enter `vsx-sync arp-security`, you must enter `vsx-sync mclag-interfaces` for enabling VSX synchronization for the ARP security feature.

The **no** form of this command removes VSX synchronization of ARP security configurations on VLAN mode and LAG interface mode to the secondary peer switch. However, it does not remove the existing ARP security configurations from the secondary peer switch.

### Examples

Enabling of VSX synchronization for ARP security feature configurations to a secondary peer:

```
primary_sw(config)# vsx
primary_sw(config-vsx)# vsx-sync arp-security
primary_sw(config-vsx)# vsx-sync mclag-interfaces
```

Disabling the VSX synchronization for ARP security feature configurations to a secondary peer:

```
primary_sw(config)# vsx
primary_sw(config-vsx)# no vsx-sync arp-security
switch(config-vsx)# no vsx-sync mclag-interfaces
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync bfd-global

```
vsx-sync bfd-global
no vsx-sync bfd-global
```

### Description

Enables syncing of global BFD configurations, such as `echo-src-ip-address`, `detect-multiplier`, `min-transmit-interval`, and `min-receive-interval`, on the primary VSX node to the secondary peer.

This command enables VSX synchronization only at the top level and not at the context level.

The **no** form of this command disables the syncing of global BFD configurations to the secondary peer, but it does not remove the existing global BFD feature configurations from it.

### Examples

Enabling VSX synchronization for various global BFD configurations:

```
switch(config)# bfd detect-multiplier 1
switch(config)# bfd min-transmit-interval 1000
switch(config)# bfd min-receive-interval 1000
switch(config)# bfd echo-src-ip-address 2.2.2.2
switch(config)# bfd min-echo-receive-interval 1000
switch(config)# vsx
switch(config-vsx)# vsx-sync bfd-global
```

Disabling VSX synchronization for global BFD configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync bfd-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync bgp

```
vsx-sync bgp
no vsx-sync bgp
```

### Description

Enables syncing of BGP configurations on the primary VSX switch to the secondary peer switch.

The **no** form of this command disables syncing BGP, as path lists, community lists, prefix lists, and route map configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer switch.

### Usage

The following BGP configurations are synchronized: as path lists, community lists, prefix lists, and route map configurations. To maintain the uniqueness of a switch in the autonomous system, the BGP router ID, BGP cluster ID, and BGP neighbor update-source are not synchronized. This exclusion is required for BGP functionality to work seamlessly even with VSX topology.

Several settings are also not synced. The `neighbor <IP address> shutdown` setting is not synced because syncing that setting would cause both the primary and secondary VSX nodes towards the core to go down. In route map configurations, the following settings are also not synced from the primary VSX switch to the secondary VSX switch, because the next-hop is always set differently for the primary and secondary VSX peers:

- `set ip nexthop <IP-ADDR>`
- `set ipv6 nexthop global <IP-ADDR>`

If the next-hop must be same for both primary and secondary VSX peers, configure the same value on the individual switches.

### Examples

Enabling VSX sync for the BGP configurations:

```
switch(config)#  ip aspath-list list1 seq 10 permit 10
switch(config)# ip community-list expanded com1 seq 10 permit 10
switch(config)# ip extcommunity-list standard ext1 seq 10 permit rt 10:4
switch(config)# ip prefix-list pref1 seq 10 permit any
switch(config)# route-map rm1 permit
switch(config-route-map-rm1-10)#  match ip next-hop 1.1.1.1
switch(config)#  router bgp 100
switch(config-bgp)# bgp router-id 1.1.1.1
switch(config-bgp)# neighbor 12.1.1.1 remote-as 1
switch(config-bgp)# address-family ipv4 unicast
switch(config-bgp-ipv4-uc)# neighbor 12.1.1.1 activate
switch(config)# vsx
switch(config-vsx)# vsx-sync bgp
```

Disabling VSX sync for the BGP configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync bgp
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync copp-policy

```
vsx-sync copp-policy
no vsx-sync copp-policy
```

### Description

Enables VSX synchronization of CoPP policy configurations on the primary VSX node to the secondary peer switch.

The **no** form of this command removes VSX synchronization of global CoPP configurations, but it does not remove the existing global CoPP configurations from the secondary peer switch.

### Examples

The first three lines in the following example show the setting of several policy configurations. The last two lines of the example show the enabling of VSX synchronization for CoPP policy configurations.

```
switch(config)# copp-policy mypolicy
switch(config-copp)# class arp-broadcast drop
switch(config-copp)# no class arp-unicast
switch(config)# vsx
switch(config-vsx)# vsx-sync copp-policy
```

Disabling VSX synchronization for global CoPP configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync copp-policy
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync dhcp-relay

```
vsx-sync dhcp-relay
no vsx-sync dhcp-relay
```

### Description

Enables VSX synchronization of DHCPv4 and DHCPv6 relay configurations on the primary VSX node to the secondary peer.

The **no** form of the command disables the VSX synchronization of DHCPv4 and DHCPv6 relay configurations to the secondary peer; however, it does not remove the existing DHCPv4 and DHCPv6 relay configurations from the secondary VSX peer.

### Examples

This example enables VSX synchronization for DHCPv4 relay configurations. The first six lines in the example show DHCPv4 relay configurations. The last two lines show how to enable VSX synchronization for the DHCP relay configurations:

```
switch(config)# interface 1/1/1
switch(config-if)# ip helper-address 192.168.10.1
switch(config-if)# ip helper-address 192.168.20.1
switch(config)# interface 1/1/2
switch(config-if)# ip helper-address 192.168.30.1
switch(config)# dhcp-relay option 82
switch(config)# vsx
switch(config-vsx)# vsx-sync dhcp-relay
```

This example enables VSX synchronization for DHCPv6 relay configurations. The first seven lines in the example show DHCPv6 relay configurations. The last two lines show how to enable VSX synchronization for the DHCP relay configurations:

```
switch(config)# dhcpv6-relay
switch(config)# interface 1/1/1
switch(config-if)# ipv6 helper-address unicast 2001:db8:0:1::
switch(config-if)# ipv6 helper-address multicast FF01::1:1000 egress 1/1/2
switch(config)# interface 1/1/2
switch(config-if)# ipv6 helper-address unicast 2001:db8:0:2::
switch(config)# dhcpv6-relay option 79
switch(config)# vsx
switch(config-vsx)# vsx-sync dhcp-relay
```

Disabling VSX synchronization for DHCP relay configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync dhcp-relay
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync dhcp-server

```
vsx-sync dhcp-server
no vsx-sync dhcp-server
```

### Description

Enables VSX synchronization of all DHCPv4 server configurations, including external storage configurations, on the primary VSX node to the secondary peer. Only the primary VSX node answers DHCP service requests, and leases can only be exported from the primary VSX node.

The **no** form of the command disables VSX synchronization of DHCPv4 server configurations to the secondary peer; however, it does not remove the existing DHCPv4 server feature configurations from the secondary peer.

### Examples

The first six lines in the following example show the setting of a DHCPv4 server configuration. The last line of the example shows the enabling of VSX synchronization for global DHCPv4 server configurations.

```
switch(config)# dhcp-server external-storage dhcp-dbs file dhcpv4_lease_file delay
600
switch(config)# dhcp-server vrf default
switch(config-dhcp-server)# pool test
switch(config-dhcp-server-pool)# range 10.0.0.20 10.0.0.30
switch(config-dhcp-server-pool)# default-router 10.0.0.1 10.0.0.10
switch(config-dhcp-server-pool)# static-bind ip 10.0.0.1 mac 24:be:05:24:75:73
switch(config)# vsx
switch(config-vsx)# vsx-sync dhcp-server
```

Disabling VSX synchronization for global DHCPv4 server configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync dhcp-server
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync dhcp-snooping

```
vsx-sync dhcp-snooping
no vsx-sync dhcp-snooping
```

### Description

Enables VSX synchronization of DHCP snooping configurations on the primary node to the secondary peer switch.

To synchronize DHCP snooping configurations associated with a particular VLAN and interface, configure the same VLAN and interface on the peer device.

The **no** form of this command disables syncing DHCP snooping configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer.

### Examples

Enabling VSX sync for the DHCP snooping configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# vsx-sync dhcp-snooping
```

Disabling VSX sync for the DHCP snooping configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync dhcp-snooping
```

#### In the DHCP snooping guard policy context

Enabling VSX-sync for the DHCPv6 snooping guard policy pol:

```
switch(config)# dhcpv6-snooping guard-policy po1
switch(config-dhcpv6-guard-policy)# vsx-sync
```

Disabling VSX-sync for the DHCPv6 snooping guard policy pol:

```
switch(config)# dhcpv6-snooping guard-policy po1
switch(config-dhcpv6-guard-policy)# no vsx-sync
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.10 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx`<br>`config-dhcpv6-guard-policy` | Administrators or local user group members with execution rights for this command. |

## vsx-sync dhcpv6-server

```
vsx-sync dhcpv6-server
no vsx-sync dhcpv6-server
```

### Description

Enables VSX synchronization of all DHCPv6 server configurations, including external storage configurations, on the primary VSX node to the secondary peer.

The **no** form of the command disables VSX synchronization of DHCPv6 server configurations to the secondary peer; however, it does not remove the existing DHCPv6 server feature configurations from the secondary peer.

### Examples

The first six lines in the following example show the setting of a DHCPv6 server configuration. The last two lines of the example show the enabling of VSX synchronization for global DHCPv6 server configurations.

```
switch(config)# dhcpv6-server external-storage dhcpv6-dbs file dhcpv6_lease_file
delay 600
switch(config)# dhcpv6-server vrf default
switch(config-dhcp-server)# pool test
switch(config-dhcpv6-server-pool)# range 2001::1 2001::10 prefix-len 64
switch(config-dhcpv6-server-pool)# option 22 ipv6 2001::12
switch(config-dhcpv6-server-pool)# static-bind ipv6 2001::11 client-id
1:0:a0:24:ab:fb:9c
switch(config)# vsx
switch(config-vsx)# vsx-sync dhcpv6-server
```

Disabling VSX synchronization for global DHCPv6 server configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync dhcpv6-server
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync dns

```
vsx-sync dns
no vsx-sync dns
```

### Description

Enables VSX synchronization of the global DNS configurations on the primary VSX node to the secondary peer switch.

The **no** form of this command removes VSX synchronization for global DNS configurations, but it does not remove the feature configurations from the secondary peer switch.

### Examples

The first line in the following example shows the setting of a DNS configuration. The last two lines of the example show the enabling of VSX synchronization for global DNS configurations.

```
switch(config)# ip dns domain-name domain.com
switch(config)# vsx
switch(config-vsx)# vsx-sync dns
```

Disabling VSX synchronization for global DNS configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync dns
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync evpn

```
vsx-sync evpn
no vsx-sync evpn
```

### Description

Enables syncing of all EVPN context-related configurations on primary VSX node to the secondary peer switch.

The **no** form of this command disables syncing EVPN configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer switch.

As a prerequisite, VLAN vsx-sync must be enabled separately for the VLAN configurations inside EVPN context to get synced.

### Examples

Enabling VSX sync for the EVPN configurations:

```
switch(config)# vlan 2
switch(config-vlan-2)# vsx-sync
switch(config)# evpn
switch(config-evpn)# vlan 2
switch(config-evpn-vlan-2)# rd 5:5
switch(config-evpn-vlan-2)# route-target export 1:1
switch(config-evpn-vlan-2)# route-target import 1:1
switch(config)# vsx
switch(config-vsx)# vsx-sync evpn
```

Disabling VSX sync for the EVPN configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync evpn
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync icmp-tcp

```
vsx-sync icmp-tcp
no vsx-sync icmp-tcp
```

### Description

Enables VSX synchronization of IP ICMP configurations, including `ip icmp unreachable`, `ip icmp redirect`, and `ip icmp throttle` configurations, on primary VSX node to the secondary peer.

The **no** form of the command disables the VSX synchronization of IP ICMP configurations to the secondary peer. However, it does not remove the existing IP ICMP configurations from the secondary VSX peer.

### Examples

Enabling VSX synchronization for IP ICMP configurations:

```
switch(config)# vsx
switch(config-vsx)# vsx-sync icmp-tcp
```

Disabling VSX synchronization for IP ICMP configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync icmp-tcp
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync keychain

```
vsx-sync keychain
no vsx-sync keychain
```

### Description

Enables synchronizing of key chain configurations on primary VSX node to the secondary peer. There is no configuration synchronization from secondary to primary peer.

If any additional modification or configuration is made on the primary for the key chain set of features, the features will be auto-synchronized.

The **no** form of the command disables synchronizing key chain configurations to the secondary peer. But it does not remove the previously synchronized configurations from the secondary peer.

### Examples

Enabling synchronizing of key chain configurations on primary VSX node to the secondary peer:

```
switch(config)# keychain ospf_keys
switch(config-keychain)# key 1
switch(config-keychain-key)# send-lifetime start-time 10:10:10 10/25/2019 end-time
10:10:10 11/25/2019
switch(config-keychain-key)# accept-lifetime duration infinite
switch(config)# vsx
switch(config-vsx)# vsx-sync keychain
```

Disabling synchronizing key chain configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync keychain
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync lldp

```
vsx-sync lldp
no vsx-sync lldp
```

### Description

Enables VSX synchronization of the LLDP configurations on the primary VSX node to the secondary peer.

The **no** form of this command disable VSX synchronization of LLDP configurations to the secondary peer, but it does not remove the existing LLDP feature configurations from the secondary peer switch.

### Examples

The first line in the following example shows the setting of an LLDP configuration. The last two lines of the example show the enabling of VSX synchronization for LLDP configurations.

```
switch(config)#  lldp reinit 6
switch(config)# vsx
switch(config-vsx)# vsx-sync lldp
```

Disabling VSX synchronization of LLDP configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync lldp
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync loop-protect-global

```
vsx-sync loop-protect-global
no vsx-sync loop-protect-global
```

### Description

Enables the VSX synchronization of global loop protect configurations, such as transmit-interval and re-enable-timer, on the primary VSX node to the secondary peer switch. To enable VSX synchronization at the context level for this feature, enter the `vsx-sync mclag-interfaces` command at the context level.

The **no** form of this command removes VSX synchronization of global loop protect configurations, but it does not remove the existing global loop protect feature configurations from the secondary peer switch.

### Examples

The first two lines in the following example show the setting of global loop protect configurations. The last two lines of the example show the enabling of VSX synchronization for global loop protect configurations.

```
switch(config)# loop-protect transmit-interval 10
switch(config)# loop-protect re-enable-timer 300
switch(config)# vsx
switch(config-vsx)# vsx-sync loop-protect-global
```

Disabling VSX synchronization of global loop protect configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync loop-protect-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync mac-lockout

Applies only to the Aruba 6400 Switch Series.

```
vsx-sync mac-lockout
no vsx-sync mac-lockout
```

### Description

Enables VSX synchronization of the MAC Lockout configurations on the primary VSX node to the secondary peer.

The **no** form of this command disables syncing MAC Lockout configurations to the secondary peer. However, it does not remove the existing MAC Lockout feature configurations from the secondary peer.

### Examples

Enabling VSX synchronization for MAC Lockout configurations:

```
switch(config)# mac-lockout 10:10:10:10:10:10
switch(config)# vsx
switch(config-vsx)# vsx-sync mac-lockout
```

Disabling VSX synchronization for MAC Lockout configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync mac-lockout
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync mclag-interfaces

```
vsx-sync mclag-interfaces
no vsx-sync mclag-interfaces
```

### Description

Enables the VSX synchronization of VSX LAG interface associations and attributes on the primary VSX switch to the secondary peer switch. The Usage section in this topic provides a listing of specific associations and attributes that are synchronized to the secondary switch.

The **no** form of this command removes VSX synchronization of global VSX LAG and attributes, but it does not remove the existing VSX LAG feature configurations from the secondary peer switch.

### Usage

The VSX LAG interface associations and attributes that support VSX synchronization are for example:

Interface associations:

- Access lists
- Policies
- QoS
- Port access
- Port filters
- Rate limits
- VLANs

Supported attributes:

- LAG description
- LACP
- Loop protect
- QoS trust
- sFlow
- STP

This configuration overrides the existing VSX synchronization associations created under the VSX LAG interface context. Also with this configuration, the system blocks further configuration of VSX synchronization associations under the VSX LAG context.

### Examples

The first four lines in the following example show the creation and configuration of a VSX LAG. The last two lines of the example show the enabling of VSX synchronization for VSX LAG interface associations and attributes.

```
switch(config)# interface lag 1 multi-chassis
switch(config-lag-if)# access-list ip MY_IP_ACL in
switch(config-lag-if)# rate-limit broadcast 50 kbps
switch(config-lag-if)# qos trust cos
switch(config-lag-if)# exit
switch(config)# vsx
switch(config-vsx)# vsx-sync mclag-interfaces
```

Disabling the VSX synchronization of VSX LAG interface associations and attributes:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync mclag-interfaces
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync nd-snooping

```
vsx-sync nd-snooping
no vsx-sync nd-snooping
```

### Description

Enables VSX synchronization of ND snooping configurations on the primary VSX node to the secondary peer switch.

To synchronize ND snooping configurations associated with a particular VLAN and interface, configure the same VLAN and interface on the peer device.

When RA guard policy is enabled, this command also synchronizes RA guard policy related configurations.

The **no** form of this command disables syncing ND snooping configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer.

### Examples

Enabling VSX sync for the ND snooping configurations to the secondary peer:

```
switch(config)# interface 1/1/3
switch(config-if)# no routing
switch(config-if)# nd-snooping trust
switch(config)# vlan 2
switch(config-vlan-2)# nd-snooping
switch(config-vlan-2)# nd-snooping ra-drop
switch(config-vlan-2)# nd-snooping prefix-list 2001::2/64
switch(config)# vsx
switch(config-vsx)# vsx-sync nd-snooping
```

Disabling VSX sync for the ND snooping configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync nd-snooping
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync neighbor

```
vsx-sync neighbor
no vsx-sync neighbor
```

### Description

Enables VSX synchronization of IPv4 and IPv6 static neighbors configuration on primary VSX node to the secondary peer. There is no configuration sync from secondary to primary peer. If any new modification or additional configuration is made on the primary node for IPv4 and IPv6 static neighbors configuration, they will be auto-synced.

The **no** form of this command VSX synchronization of IPv4 and IPv6 static neighbors configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer switch.

### Examples

Enabling VSX sync for the IPv4 and IPv6 static neighbors configurations:

```
DUT-1 (config-vsx)# show run in vlan127
interface vlan127
               ip address 137.1.1.1/16
               ipv6 address 7f00::1/64
               arp ipv4 137.1.1.35 mac 00:12:01:00:00:1a
               arp ipv4 137.1.1.70 mac 00:12:01:00:00:3d
               exit
DUT-1(config-vsx)
switch(config)# vsx
switch(config-vsx)# vsx-sync neighbor
```

Disabling VSX sync for the IPv4 and IPv6 static neighbors configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync neighbor
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync ospf

```
vsx-sync ospf
no vsx-sync ospf
```

### Description

Enables syncing of OSPF (including OSPFv2 and OPSFv3), route map, and key chain configurations on the primary VSX switch. There is no configuration sync from secondary to primary peer.

To synchronize OSPF configurations at the port level context, configure the same port on the peer device.

The **no** form of this command disables syncing of OSPF, route map, and key chain configurations to the secondary peer. But it does not remove the previously synced configurations from the secondary peer switch.

The OSPF router ID is not synchronized. This exclusion is needed because the router ID uniquely identifies the router. The two OSPF routers with the same router ID do not form an adjacency between them.

### Examples

Enabling VSX sync for the OSPF configurations to the secondary peer:

```
switch(config)# router ospf 1
switch(config-ospf-1)# area 0
switch(config-ospf-1)# area 1 nssa
switch(config-ospf-1)# area 2 stub
switch(config-ospf-1)# redistribute connected route-map map1
switch(config)# router ospfv3 1
switch(config-ospfv3-1)# max-metric router-lsa on-startup
switch(config-ospfv3-1)# bfd all-interfaces
switch(config-if)# ip ospf 1 area 0
switch(config-if)# ip ospf hello-interval 33
switch(config-if)# ipv6 ospfv3 1 area 0
switch(config-if)# ipv6 ospfv3 dead-interval 55
switch(config)# vsx
switch(config-vsx)# vsx-sync ospf
```

Disabling VSX sync for the OSPF configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync ospf
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# vsx-sync policy-global

```
vsx-sync policy-global
no vsx-sync policy-global
```

### Description

Enables VSX synchronization of global classifier policy configurations on the primary VSX node to the secondary peer switch.

The **no** form of this command disables VSX synchronization of global policy configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer switch.

### Examples

Enabling VSX sync for the global policy configurations to the secondary peer:

```
switch(config)# apply policy testPolicy in
switch(config)# vsx
switch(config-vsx)# vsx-sync policy-global
```

Disabling VSX sync for the global policy configurations to the secondary peer:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync policy-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync port-access

```
vsx-sync port-access
no vsx-sync port-access
```

### Description

Enables VSX synchronization of port-access configurations such as MAC groups, LLDP groups, CDP groups, Port-Access roles, and Device-Profile to the secondary peer.

The **no** form of this command disables VSX synchronization of port-access configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer switch.

### Usage

The port-access configurations that support VSX synchronization are:

- port-access cdp-group
- port-access device-profile
- port-access lldp-group
- mac-group

- port-access role with the following attributes
  - auth-mode
  - gbp
  - mtu
  - poe-allocate-by
  - poe-priority
  - private-vlan
  - stp-admin-edge-port
  - trust-mode
  - vlan

### Examples

Enabling VSX sync for port-access configuration:

```
switch(config)# port-access lldp-group l1
switch(config-lldp-group)# match sysname 6405
switch(config-lldp-group)# exit
switch(config)# vsx-sync mclag-interfaces
switch(config)# port-access role r1
switch(config-pa-role)# private-vlan port-type secondary
switch(config-pa-role)# exit
switch(config)# port-access device-profile dp1
switch(config-device-profile)# enable
switch(config-device-profile)# associate role r1
switch(config-device-profile)# associate lldp-group l1
```

Disabling VSX sync for port-access configuration:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync port-access
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Added VSX synchronization options for port-access configurations. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# vsx-sync private-vlan-global

```
vsx-sync private-vlan-global
no vsx-sync private-vlan-global
```

### Description

Enable sync for private VLAN global configuration on the primary VSX node to the secondary peer.

Private VLAN global configuration syncing is supported on the switch by configuring the feature name under **vsx** configuration context.

There are no parameters in this command.

The **no** form of this command disables Private VLAN global configuration syncing to the secondary peer.

### Examples

```
switch(config)# vsx
switch(config-vsx)# vsx-sync private-vlan-globalx

switch(config)# vsx
switch(config-vsx)# no vsx-sync private-vlan-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# vsx-sync qos-global

```
vsx-sync qos-global
no vsx-sync qos-global
```

### Description

Enables the VSX synchronization of global QoS configurations, such as CoS map, DSCP map, and trust policy, on the primary VSX node to the secondary peer switch. To enable VSX synchronization at the context level for this feature, enter the `vsx-sync qos` command at the context level.

The **no** form of this command removes VSX synchronization of global QoS configurations, but it does not remove the existing global QoS feature configurations from the secondary peer switch.

### Examples

The first five lines in the following example show the setting of global QoS configurations. The last two lines of the example show the enabling of VSX synchronization for global QoS configurations.

```
switch(config)# qos cos-map 1 local-priority 0
switch(config)# qos cos-map 0 local-priority 1
switch(config)# qos cos-map 2 local-priority 2
switch(config)# qos dscp-map 2 local-priority 3
switch(config)# qos trust dscp
switch(config)# vsx
switch(config-vsx)# vsx-sync qos-global
```

Disabling VSX synchronization of global QoS configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync qos-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync route-map

```
vsx-sync route-map
no vsx-sync route-map
```

### Description

Enables syncing of all As Path lists, community lists, prefix lists, and route map configurations on primary VSX node to the secondary peer switch. There is no configuration sync from the secondary to primary peer.

The **no** form of this command disables syncing of As Path lists, community lists, prefix lists, and route map configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer switch.

When vsx-sync for BGP or OSPF is configured, route map configurations are synchronized from primary VSX node to the secondary peer due to the dependency in configurations.

### Examples

Enabling VSX sync for the route map configurations:

```
switch(config)#  ip aspath-list list1 seq 10 permit 10
switch(config)# ip community-list expanded com1 seq 10 permit 10
switch(config)# ip extcommunity-list standard ext1 seq 10 permit rt 10:4
switch(config)# ip prefix-list pref1 seq 10 permit any
switch(config)# route-map rm1 permit
switch(config-route-map-rm1-10)# match ip next-hop 1.1.1.1
switch(config)# vsx
switch(config-vsx)# vsx-sync route-map
```

Disabling VSX sync for the route map configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync route-map
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync sflow

```
vsx-sync sflow
no vsx-sync sflow
```

### Description

Enables VSX synchronization of the sFlow configurations on the primary VSX node to the secondary peer.

The **no** form of this command removes VSX synchronization of global sFlow configurations, but it does not remove the existing global sFlow feature configurations from the secondary peer switch.

### Usage

To maintain compliance with sFlow collector functionality for non-VSX topology, the `vsx-sync sflow` command on primary VSX peer is expected to sync all sFlow configurations, except for the `agent-ip` configuration. This exclusion is required for sFlow collector functionality to work seamlessly even with VSX topology.

### Examples

The first line in the following example shows the setting of an sFlow configuration. The last two lines of the example show the enabling of VSX synchronization for sFlow configurations.

```
switch(config)# sflow agent-ip 10.0.0.100
switch(config)# vsx
switch(config-vsx)# vsx-sync sflow
```

Disabling VSX synchronization of global sFlow configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync sflow
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync sflow-global

```
vsx-sync sflow-global
no vsx-sync sflow-global
```

### Description

Enables VSX synchronization of the sFlow global configurations on the primary VSX node to the secondary peer.

The **no** form of this command disables VSX synchronization of global sFlow configurations, but it does not remove the existing sFlow feature configurations from the secondary peer switch.

### Usage

To maintain compliance with sFlow collector functionality for non-VSX topology, the `vsx-sync sflow` command on primary VSX peer is expected to sync all sFlow configurations, except for the `agent-ip` configuration. This exclusion is required for sFlow collector functionality to work seamlessly even with VSX topology. VSX syncs only the global sFLow configurations and not the sFlow configurations under physical or LAG interfaces.

### Examples

The first line in the following example shows the setting of an sFlow configuration. The last two lines of the example show the enabling of VSX synchronization for sFlow configurations.

```
switch(config)# sflow collector 1.1.1.1
switch(config)# vsx
switch(config-vsx)# vsx-sync sflow-global
```

Disabling VSX synchronization of global sFlow configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync sflow-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync snmp

```
vsx-sync snmp
no vsx-sync snmp
```

### Description

Enables VSX synchronization of SNMP configurations on the primary VSX node to the secondary peer.

The **no** form of this command removes VSX synchronization of global SNMP configurations, but it does not remove the existing global SNMP feature configurations from the secondary peer switch.

### Examples

Enabling VSX synchronization for SNMP configuration:

```
switch(config)# vsx
switch(config-vsx)# vsx-sync snmp
```

Disabling VSX synchronization for SNMP configuration:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync snmp
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync ssh

```
vsx-sync ssh
no vsx-sync ssh
```

### Description

Enables VSX synchronization of SSH server configurations on the primary VSX node to the secondary peer switch.

The **no** form of this command removes VSX synchronization of global SSH configurations, but it does not remove the existing global SSH feature configurations from the secondary peer switch.

### Examples

The first line in the following example shows the setting of an SSH server configuration. The last two lines of the example show the enabling of VSX synchronization for SSH server configurations.

```
switch(config)# ssh certified-algorithms-only
switch(config)# vsx
switch(config-vsx)# vsx-sync ssh
```

Disabling VSX synchronization for global SSH server configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync ssh
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync static-routes

```
vsx-sync static-routes
no vsx-sync static-routes
```

### Description

Enables VSX synchronization of static route configurations on the primary VSX node to the secondary peer switch.

The **no** form of this command removes VSX synchronization of global static route configurations, but it does not remove the existing global static route feature configurations from the secondary peer switch.

### Examples

Enabling VSX synchronization for static routes:

```
switch(config)# vsx
switch(config-vsx)# vsx-sync static-routes
```

Disabling VSX synchronization for static routes:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync static-routes
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# vsx-sync stp-global

```
vsx-sync stp-global
no vsx-sync stp-global
```

## Description

Enables the VSX synchronization of global STP configurations on the primary VSX node to the secondary peer switch. Use the `vsx-sync mclag-interfaces` command to sync context level spanning trees. To enable VSX synchronization at the context level for this feature, enter the `vsx-sync mclag-interfaces` command at the context level.

The **no** form of this command removes VSX synchronization of global STP configurations, but it does not remove the existing global STP feature configurations from the secondary peer switch.

## Examples

The first two lines in the following example show the setting of global STP configurations. The last two lines of the example show the enabling of VSX synchronization for global STP configurations.

```
switch(config)# spanning-tree config-name abc
switch(config)# spanning-tree config-revision 1
switch(config)# vsx
switch(config-vsx)# vsx-sync stp-global
```

Disabling VSX synchronization of global STP configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync stp-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# vsx-sync telnet

```
vsx-sync telnet
no vsx-sync telnet
```

## Description

Enables VSX synchronization of Telnet server configurations from the primary VSX node to the secondary peer. To synchronize Telnet configurations associated with a particular VRF, you need to configure the same VRF on the peer device.

The **no** form of the command disables VSX synchronization of Telnet server configurations to the secondary peer, however, it does not remove the existing Telnet server configurations from the secondary peer.

## Examples

Enabling VSX synchronization of Telnet servers:

```
switch(config)# telnet server vrf main
switch(config)# vsx
switch(config-vsx)# vsx-sync telnet
```

Disabling VSX synchronization of Telnet servers:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync telnet
```

## Command History

| Release | Modification |
|---|---|
| 10.08.1000 | Command introduced on the 6400 Switch Series. |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

# vsx-sync time

```
vsx-sync time
no vsx-sync time
```

## Description

Enables VSX synchronization of time-related configurations, including NTP and time zone configurations, on the primary VSX node on the secondary peer switch.

The **no** form of this command removes VSX synchronization of global time-related configurations, but it does not remove the existing global time-related feature configurations from the secondary peer switch.

### Examples

The first two lines in the following example show the setting of time-related configurations. The last two lines of the example show the enabling of VSX synchronization for time-related configurations.

```
switch(config)# ntp authentication
switch(config)# clock timezone utc
switch(config)# vsx
switch(config-vsx)# vsx-sync time
```

Disabling VSX synchronization for time-related configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync time
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync udp-forwarder

```
vsx-sync udp-forwarder
no vsx-sync udp-forwarder
```

### Description

Enables VSX synchronization of UDP forwarder configurations on the primary VSX node to the secondary peer.

The **no** form of the command disables the VSX synchronization of UDP forwarder configurations to the secondary peer; however, it does not remove the existing udp-forwarder configurations from the secondary VSX peer.

### Examples

Enabling VSX synchronization for UDP forwarder configurations:

```
switch(config)# vsx
switch(config-vsx)# vsx-sync udp-forwarder
```

Disabling VSX synchronization for UDP forwarder configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync udp-forwarder
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync vrrp

```
vsx-sync vrrp
no vsx-sync vrrp
```

### Description

Enables VSX synchronization of all VRRP configurations on the primary VSX node to the secondary peer switch. There is no configuration sync from secondary to primary peer.

To synchronize VRRP configurations at the port level context, the same port must be configured on the peer device with IP address.

The **no** form of this command disables syncing VRRP configurations to the secondary peer, but it does not remove the previously synced configurations from the secondary peer.

BFD IP is the IP address of VRRP peer device. Hence it cannot be synced.

In the owner scenario, in case the priority is synced, both VSX primary and secondary devices will have 255 as their priority. If the primary device goes down and comes up again, the secondary device will still act as the Active in spite of the primary device being the owner. Hence priority cannot be synced.

### Examples

Enabling VSX sync for the VRRP configurations to the secondary peer:

```
switch(config)# router vrrp enable
switch(config-if)# vrrp 1 address-family ipv4
switch(config-if-vrrp)# address 1.1.1.100 primary
switch(config-if-vrrp)# timers advertise 1000
switch(config-if-vrrp)# no shutdown
switch(config-if)# vrr 1 address-family ipv6
switch(config)# vsx
switch(config-vsx)# vsx-sync vrrp
```

Disabling VSX sync for the VRRP configurations to the secondary peer:

```
switch(config)#
```

```
switch(config-vsx)# no vsx-sync vrrp
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | `config-vsx` | Administrators or local user group members with execution rights for this command. |

## vsx-sync vsx-global

```
vsx-sync vsx-global
no vsx-sync vsx-global
```

### Description

Enables VSX synchronization of global VSX configurations on the primary VSX node to the secondary peer.

The **no** form of the command disables VSX synchronization of global VSX configurations to the secondary peer; however, it does not remove the existing VSX feature configurations from the secondary peer.

### Usage

The following commands are synced from primary VSX node to secondary VSX node:

- inter-switch-link dead-interval *<DEAD-INTERVAL>*
- inter-switch-link hello-interval *<HELLO-INTERVAL>*
- inter-switch-link hold-time *<HOLD-INTERVAL>*
- inter-switch-link peer-detect-interval *<PEER-DETECT-INTERVAL>*
- keepalive dead-interval *<DEAD-INTERVAL>*
- keepalive hello-interval *<HELLO-INTERVAL>*
- keepalive udp-port *<PORT-NUM>*
- linkup-delay-timer *<DELAY-TIMER>*
- split-recovery
- system-mac *<MAC-ADDR>*

### Examples

The first three lines in the following example show the setting of global VSX configurations. The last line in the example shows the enabling of VSX synchronization for global VSX configurations.

```
switch(config)# vsx
switch(config-vsx)# inter-switch-link dead-interval 15
switch(config-vsx)# inter-switch-link hello-interval 2
switch(config-vsx)# inter-switch-link hold-time 1
switch(config-vsx)# vsx-sync vsx-global
```

Disabling VSX synchronization for global VSX configurations:

```
switch(config)# vsx
switch(config-vsx)# no vsx-sync vsx-global
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | config-vsx | Administrators or local user group members with execution rights for this command. |

## vsx update-software

vsx update-software *<REMOTE-URL>* [vrf *<VRF-NAME>*]

### Description

This command lets you update the software.

| Parameter | Description |
|---|---|
| `<REMOTE-URL>` | Specifies the TFTP URL for downloading the software. Syntax: `tftp://{<IP-ADDRESS>\|<HOSTNAME>}[:<PORT>] [;blocksize=<VAL>]/<FILE-NAME>` |
| `vrf <VRF-NAME>` | Specifies the VRF name for downloading the software. Optional |

## Usage

This command gives you the option to save the running configuration on the primary and secondary VSX switches. After the command saves the running configuration, it downloads new software from the TFTP server and verifies the download. After a successful verification, the command installs the software to the alternative image of both the VSX primary and secondary switches.

The command displays the status of the VSX primary and secondary switches during the upgrade. The command also refreshes the progress bar as the image update progresses. Do not interrupt the VSX primary CLI session until the software updates completes; however, software update process can be stopped. If you stop the upgrade when the secondary switch has already installed the image in its flash memory or the secondary switch has started the reboot the process, it comes up with the new software. The primary switch continues to have with older software. You can stop the software update process by pressing **ctrl+c**.

## Example

Updating the software using TFTP:

```
switch# vsx update-software tftp://192.168.1.1/XL.10.0x.xxxx vrf mgmt
Do you want to save the current configuration (y/n)? y
The running configuration was saved to the startup configuration.

This command will download new software to the %s image of both the VSX primary
and
secondary systems, then reboot them in sequence. The VSX secondary will reboot
first, followed by the primary.
Continue (y/n)? y
VSX Primary Software Update Status     : <VSX primary software update status>
VSX Secondary Software Update Status   : <VSX secondary software update status>
VSX ISL Status                         : <VSX ISL status>
Progress
[..........................................................................]
Secondary VSX system updated completely. Rebooting primary.
```

For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |

## vsx update-software boot-bank

`vsx update-software boot-bank {primary | secondary}`

### Description

Upgrades the VSX pairs using the specified bank on both the devices. This command compares whether the image versions are same in both the primary and secondary switches and reboots them in sequence, the VSX secondary switch followed by VSX primary switch.

Before executing this command, download the software image and install in the required boot banks.

| Parameter | Description |
|---|---|
| `boot-bank` | Specifies the boot bank where the image is pre-staged . |
| `{primary \| secondary}` | Selects either primary or secondary VSX switch for the software upgrade. |

### Usage

This command gives you the option to save the running configuration on the primary and secondary VSX switches. After the command saves the running configuration, it downloads new software from the TFTP server and verifies the download. After a successful verification, the command installs the software to the alternative image of both the VSX primary and secondary switches.

The command displays the status of the VSX primary and secondary switches during the upgrade. The command also refreshes the progress bar as the image update progresses. Do not interrupt the VSX primary CLI session until the software updates completes; however, software update process can be stopped. If you stop the upgrade when the secondary switch has already installed the image in its flash memory or the secondary switch has started the reboot the process, it comes up with the new software. The primary switch continues to have with older software. You can stop the software update process by pressing **ctrl+c**.

### Example

Selecting primary bank for upgrade:

```
switch# vsx update-software boot-bank primary
Do you want to save the current configuration (y/n)? y
The running configuration was saved to the startup configuration.

This command will upgrade both VSX primary and secondary systems, using pre-staged
image 'X' installed in secondary bank on both devices, then reboot
them in sequence. The VSX secondary will reboot first, followed by primary.
Continue (y/n)? y
VSX Primary Software Update Status     : Reboot started
VSX Secondary Software Update Status   : Image updated successfully
VSX ISL Status                         : Up
```

```
Progress [.....................................................................]
Secondary VSX system updated completely. Rebooting primary.
```

Selecting secondary bank for upgrade:

```
switch# vsx update-software boot-bank secondary
Do you want to save the current configuration (y/n)? y
The running configuration was saved to the startup configuration.

This command will upgrade both VSX primary and secondary systems, using pre-staged
image 'X' installed in secondary bank on both devices, then reboot
them in sequence. The VSX secondary will reboot first, followed by primary.
Continue (y/n)? y
VSX Primary Software Update Status     : Reboot started
VSX Secondary Software Update Status   : Image updated successfully
VSX ISL Status                         : Up
Progress [......................................................................]
Secondary VSX system updated completely. Rebooting primary.
```

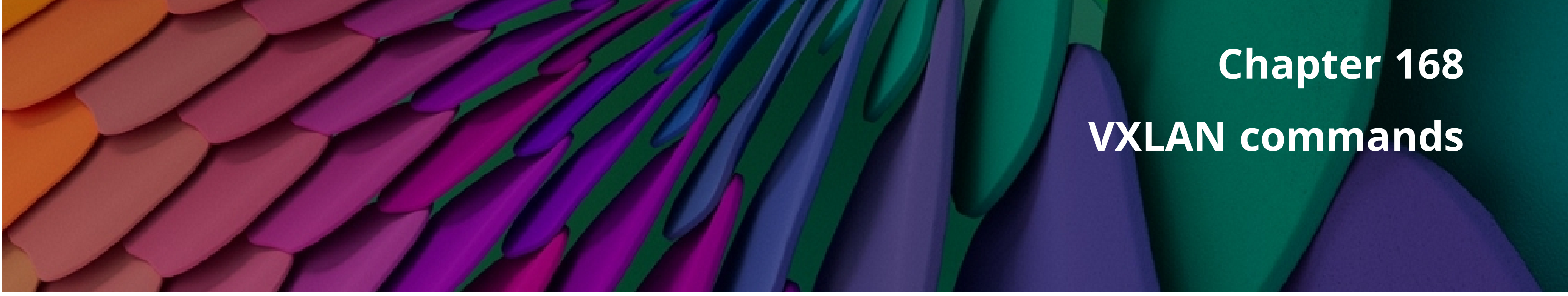
For more information on features that use this command, refer to the Virtual Switching Extension (VSX) Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6400 | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 168
# VXLAN commands

## interface vxlan

```
interface vxlan 1 [mode ipv4|ipv6]
no interface vxlan 1 [mode ipv4|ipv6]
```

### Description

Creates VXLAN interface 1 and changes to the **config-vxlan-if** context. A maximum of one VXLAN interface is supported. By default, the VXLAN is disabled. To enable the VXLAN, use the command **no shutdown**.

The **no** form of this command removes VXLAN interface 1. This deletes the VXLAN tunnel, and all VNIs and VLAN-to-VNI mappings associated with it.

| Parameter | Description |
|---|---|
| `1` | Only one VXLAN interface is supported. |
| mode ipv4\|ipv6 | (Optional) Specify if the interface tunnel uses IPv4 or IPv6 addressing. If this parameter is not included, the interface default is IPv6. |

### Examples

Creating VXLAN interface 1:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)#
```

Deleting VXLAN interface 1:

```
switch(config)# no interface vxlan 1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11.1000 | Added IPv6 support for 6300, 6400, 8100, and 8360 Switch Series. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

# inter-vxlan-bridging mode

```
inter-vxlan-bridging mode {deny | static-evpn | static-all}
no inter-vxlan-bridging mode {static-evpn | static-all}
```

## Description

Changes the inter-VXLAN bridging mode on tunnels where VXLAN bridging across tunnels is disabled by default. Default mode is deny.

The **no** form of this command sets the inter-VXLAN bridging mode to the default mode of deny.

| Parameter | Description |
|---|---|
| `deny` | Specifies disabling inter-VXLAN bridging across tunnels. |
| `static-evpn` | Specifies enabling inter-VXLAN bridging between static and dynamic tunnels. |
| `static-all` | Specifies enabling inter-VXLAN bridging between static and all tunnels. |

## Usage

- By default, inter VXLAN bridging is disabled. Therefore, packets arriving over an L2VNI over a VXLAN tunnel are not forwarded on the same L2VNI over another VXLAN tunnel. VXLAN bridging across tunnels is disabled by default.
- To enable VXLAN bridging between static and dynamic tunnels, set the mode to `static-evpn`.
- To enable VXLAN bridging between static and all other static and dynamic tunnels, set the mode to `static-all`. Since dynamic tunnels for single fabric are always full mesh, VXLAN bridging between dynamic tunnels remains blocked.

Configuration of static tunnels is not recommended on VTEPs where split horizon is disabled between the EVPN tunnels, either by using the ibgp-ebgp command or by using the route map- based broadcast-group configuration.

## Examples

Enabling VXLAN bridging between static and dynamic tunnels:

```
switch(config-vxlan-if)# inter-vxlan-bridging-mode static-evpn
```

Disabling VXLAN bridging between static and dynamic tunnels:

```
switch(config-vxlan-if)# no inter-vxlan-bridging-mode static-evpn
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.08 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vxlan-if` | Administrators or local user group members with execution rights for this command. |

## mcast-group flood

```
mcast-group flood ip <IP-ADDR>
no mcast-group flood ip <IP-ADDR>
```

### Description

Overrides the automatic assignment of the multicast group IP for the VNI flood replication in underlay multicast replication mode. This command is only usable if **underlay-multicast replication mode** is configured.

The **no** form of this command removes the mcast-group flood configuration.

| Parameter | Description |
|---|---|
| `ip <IP-ADDR>` | Specifies the multicast group address in IPv4 format (x.x.x.x) where x is a decimal number from 0 to 255. |

### Examples

Configuring mcast-group flood for IPv4 multicast address **239.1.14.10**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# mcast-group flood ip 239.1.14.10
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vni-<VNI-NUMBER>` | Administrators or local user group members with execution rights for this command. |

# replication-mode

```
replication-mode {ingress | underlay-multicast [pim-bidir]
[flood-group-range <IPV4-ADDR>/MASK>]}
no replication-mode {ingress | underlay-multicast [pim-bidir]
[flood-group-range <IPV4-ADDR>/MASK>]}
```

## Description

Configures the global replication mode for overlay flood traffic within a VXLAN domain.

In ingress mode the source VXLAN tunnel endpoint replicates flood or BUM (broadcast, unknown unicast, multicast) traffic for every destination remote tunnel endpoint. This is the default mode when a VXLAN interface is created. The source tunnel endpoint forwards the packet over each point to point unicast VXLAN tunnel.

When underlay-multicast replication mode is configured, then overlay flood traffic replication occurs in the multicast underlay network. The source VXLAN tunnel endpoint forwards the packet to a multipoint VXLAN tunnel.

For the multicast tree to be built dynamically, each flood domain must be mapped to a multicast group IP address. That address is used by the PIM control protocol to build and join the multicast tree in the underlay network.

The replication mode command has auto mapping option called **flood-group-range**. When a multicast group IP address range is specified the software maps the L2 VNIs to the group IP addresses. A static group IP configuration is allowed at the VNI level and if configured will override the automatic assignment of multicast group IP addresses to the VNI.

The group IP range in the **interface vxlan** context and the group IP in the **VNI** context should be consistently configured across all the tunnel endpoint devices in the VXLAN domain.

Static VXLAN tunnels are not supported in underlay-multicast mode.

The following features are not supported when operating in the underlay multicast replication mode:

1. Multi-fabric
2. Static VXLAN
3. GPO
4. EVPN multi-homing (overlay ECMP)
5. VLAN-aware bundling
6. IP-directed broadcast over VXLAN tunnels (IPDB)
7. Network load balancing over VXLAN tunnels (NLB)
8. IPv6 VXLAN mode
9. Fast roaming

The **no** form of this command removes the replication mode configuration.

| Parameter | Description |
|---|---|
| `ingress` | Selects ingress as the replication mode. Overlay flood traffic is replicated in the ingress node using point to point VXLAN tunnel. Default. |
| `underlay-multicast` | Selects underlay multicast as the replication mode. Flood or BUM traffic is replicated in the underlay multicast network via multipoint VXLAN tunnel. |
| `pim-bidir` | Selects pim-bidir. Default multicast routing protocol in **replication-mode underlay-multicast** configuration when the VxLAN interface is operating in IPv4. |
| `flood-group-range` | Specifies the multicast group address range. |
| *<IPV4-ADDR>* | Specifies the multicast group IP address range in IPv4 format (x.x.x.x) where x is a decimal number from 0 to 255. |
| *<MASK>* | Specifies the subnet mask for the group range in CIDR notation as a decimal number from 1-32. |

### Examples

Configuring underlay multicast replication mode:

```
switch(config-vxlan-if)# replication-mode underlay-multicast pim-bidir flood-
group-range 239.1.0.0/24
```

Configuring ingress replication mode:

```
switch(config-vxlan-if)# replication-mode ingress
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Command introduced. |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vxlan-if` | Administrators or local user group members with execution rights for this command. |

## routing

```
vni <VNI-NUMBER>
no vni <VNI-NUMBER>
```

### Description

Enables a layer 3 VNI for EVPN VXLAN distributed L3 gateways with symmetric IRB. The VNI is automatically assigned the default VRF. To assign another VRF, use the command **vrf**. Used with EVPN-based VXLANs. If a user tries to enable routing on a VNI already associated to a VLAN, an appropriate warning is displayed.

The **no** form of this command disables symmetric routing on a VNI.

If you enable this configuration, collection of flow tracking statistics is disabled.s

### Examples

Enabling L3 VNI **1000** for EVPN VXLAN distributed L3 gateways with symmetric IRB using VRF **vrf-1**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# routing
switch(config-vni-1000)# vrf vrf-1
```

Disabling L3 VNI **1000** for EVPN VXLAN distributed L3 gateways with symmetric IRB:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# no routing
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.14 | Added information related to role based IPFIX. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vni-<VNI-NUMBER>` | Administrators or local user group members with execution rights for this command. |

## show interface vxlan

```
show interface vxlan <IFNAME>
```

### Description

Shows detailed VXLAN interface information.

| Parameter | Description |
|---|---|
| *<IFNAME>* | Specifies the VXLAN interface to show. |

### Example

*On the 6400 Switch Series, interface identification differs.*

Showing settings for VXLAN interface 1.

```
switch# show interface vxlan1
Interface vxlan1 is up
Admin state is up
Description:VXLAN1
Underlay VRF: default
Destination UDP port: 4789
VTEP source IPv4 address: 1.1.1.1

VNI        Routing   VLAN  VRF       VTEP Peers        Origin
---------- --------  ----  --------  ----------------- --------
10         disabled  10    --        2.2.2.2           static
10         disabled  10    --        3.3.3.3           static
10         disabled  10    --        4.4.4.4           static
20         disabled  20    --        5.5.5.5           evpn
20         disabled  20    --        6.6.6.6           evpn
30         disabled  --    --        --                static
40         disabled  40    --        --                static
50         disabled  --    --        7.7.7.7           static
4000       enabled   --    default   22.1.1.2          evpn
4001       enabled   --    default   23.1.1.3          evpn

Aggregate Statistics
--------------------
 Decap:
      104222 input packets             15841744 bytes
         236 broadcast packets            26942 bytes
           0 drop packets
 Encap:
      108527 output packets            11068728 bytes
           6 BUM packets                    422 bytes
           0 drop packets
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

# show interface vxlan multipoint-tunnel

```
show interface vxlan multipoint-tunnel [forwarding-status|flood-
status|brief|statistics|<IP-ADDR>|brief|group-mapping]
```

## Description

Shows detailed VXLAN interface information.

| Parameter | Description |
|---|---|
| `forwarding-status` | Shows multipoint tunnel encap and decap forwarding status. |
| `flood-status` | Shows multipoint tunnel flood status. |
| `statistics` | Shows multipoint tunnel encap and decap statistics. |
| `<IP-ADDR>` | Specifies a multipoint tunnel. |
| `brief` | Shows brief information about multipoint tunnels. |
| `group-mapping` | Shows the underlay-mapped multicast group |

## Example

*On the 6400 Switch Series, interface identification differs.*

Showing information for all multipoint tunnels:

```
switch# show interface vxlan multipoint-tunnel
Destination             :  239.1.0.1
Source                  :  1.1.1.1
Origin                  :  pim-bidir
VRF                     :  default
Type                    :  flood
Encap Status            :  Up
Decap Status            :  Up
Underlay Information
========
    L3 Interface  L2 Interface
    ------------  ------------
    VLAN10        1/1/53


Destination             :  239.1.0.2
Source                  :  1.1.1.1
Origin                  :  pim-bidir
VRF                     :  default
Type                    :  flood
Encap Status            :  Up
Decap Status            :  Up
Underlay Information
```

```
========
    L3 Interface  L2 Interface
    ------------  ------------
    VLAN10        1/1/53
```

Showing brief information about multipoint tunnels:

```
switch# show interface vxlan multipoint-tunnel brief
Type    Source         Destination         Origin       VNI       VLAN  VRF
------  ----------    -----------------   ------------ -------   ----- ----
flood   1.1.1.1        239.1.0.1           pim-bidir    1         1     Default
```

Showing multipoint tunnel encap and decap forwarding status:

```
switch# show interface vxlan multipoint-tunnel forwarding-status
Type             Source      Destination  Status(Encap)  Status(Decap)
---------------- ----------- ------------ -------------  -------------
flood            1.1.1.1     239.1.0.1    up             up
```

Showing multipoint tunnel flood status:

```
switch# show interface vxlan multipoint-tunnel flood-status
Source       Destination  Status    VNI       VLAN
------------ ---------    -------   --------- -----
1.1.1.1      239.1.0.1    enabled   1         1
1.1.1.1      239.1.0.10   disabled  10        10
1.1.1.1      239.1.0.100  faulty    100       100
```

Showing multipoint tunnel encap and decap statistics:

```
switch# show interface vxlan multipoint-tunnel statistics
Type      Destination Tx Packets(Encap)  Tx Bytes(Encap) Rx Packets(Decap) Rx Bytes(Decap)
--------- ----------- -----------------  --------------- ----------------  ---------
flood     239.1.0.1   224                21950           223               21836
```

Showing information for multipoint tunnel with a destination IP of **239.1.0.1**:

```
switch# show interface vxlan multipoint-tunnel 239.1.0.1
Destination             :  239.1.0.1
Source                  :  1.1.1.1
Origin                  :  pim-bidir
VRF                     :  default
Type                    :  flood
Encap Status            :  Up
Decap Status            :  Up
Underlay Information
========
    L3 Interface  L2 Interface
    ------------  ------------
    VLAN10        1/1/53
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (`#`) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show interface vxlan vni

```
show interface vxlan vni <VNI-NUMBER> vteps
```

### Description

Shows detailed VNI information for VXLAN interface 1.

| Parameter | Description |
|---|---|
| *<VNI-NUMBER>* | Specifies the number for a VNI. Range: 1 to 16777214. |

### Usage

Status can be one of the following:

- operational: Virtual network ID is fully programmed on the switch hardware.
- configuration_error: Virtual network ID programming in the switch hardware failed due to misconfiguration.
- no_hw_resources: Virtual network ID programming failed in the switch hardware due to insufficient resources.
- activating: Initial state of virtual network ID when it is configured.

When a tunnel endpoint is a directly connected via nexthop, then nexthop reachability appears empty (--).

### Example

Showing VNI information:

~~~
switch# show interface vxlan vni
VNI        : 1000          VLAN   : 10
Routing    : disabled      VRF    : --
VNI-Status : operational

VNI        : 2000          VLAN   : 20
Routing    : enabled       VRF    : default
VNI-Status : activating
```
~~~

~~~~
```
switch# show interface vxlan vni 1000
VNI         : 1000          VLAN   : 10
Routing     : disabled      VRF    : --
VNI-Status  : operational
~~~~

```
switch# show interface vxlan vni vteps
VNI         : 1000          VLAN   : 10
Routing     : disabled      VRF    : --
VNI-Status  : operational
VTEPS
=====
    ORIGIN     SOURCE     DESTINATION  VRF      VTEP-STATUS
    ---------  ---------  -----------  -------  ------------
    static     11.0.0.1   11.0.0.2     default  operational


VNI         : 2000          VLAN   : 20
Routing     : enabled       VRF    : default
VNI-Status  : operational
VTEPS
=====
    ORIGIN     SOURCE     DESTINATION  VRF      VTEP-STATUS
    ---------  ---------  -----------  -------  ------------
    evpn       11.0.0.1   14.0.0.2     default  activating
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show interface vxlan vteps

`show interface vxlan vteps [detail | <IPV4-ADDR>]`

### Description

Shows information about the VTEPs on VXLAN interface 1.

| Parameter | Description |
|---|---|
| `detail` | Show detailed information. |
| *`<IPV4-ADDR>`* | Specifies the IP address of a VTEP peer in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |

## Usage

Status can be one of the following:

- operational: Tunnel endpoint is fully programmed on the switch hardware.
- configuration_error: Tunnel endpoint programming in the switch hardware failed due to misconfiguration.
- no_hw_resources: Tunnel endpoint programming failed in the switch hardware due to insufficient resources.
- activating: Initial state of tunnel endpoint when it is configured.

When a tunnel endpoint is a directly connected via nexthop, then nexthop reachability appears empty (--).

## Example

*On the 6400 Switch Series, interface identification differs.*

Showing information for VTEPs on a VXLAN interface with IPv4 source and destination IP addresses.

```
switch# show interface vxlan vteps
Source      Destination   Origin   Status           VNI    Routing   VLAN  VRF
----------- ------------- -------- ---------------- ------ --------  ----  -------
-
11.0.0.1    11.0.0.2      static   operational      1000   disabled  10    --
11.0.0.1    12.0.0.2      static   activating       2000   disabled  20    --
11.0.0.1    22.1.1.1      evpn     operational      4000   enabled   --    red
11.0.0.1    23.1.1.1      evpn     activating       4001   enabled   --    blue
```

Showing information the VTEPs on a VXLAN interface with IPv6 source and destination IP addresses.

```
switch# show interface vxlan vteps
Source            Destination       Origin Status       VNI       Routing   VLAN
VRF
----------------   ---------------  -----  ----------   --------- --------- ----- -
-----
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational   11        enabled   --
vrf1
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational   12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational   1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational   1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational   1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational   1002002   disabled  2002
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational   11        enabled   --
vrf1
```

```
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1002002   disabled  2002
--
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  11        enabled   --
vrf1
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1002002   disabled  2002
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  11        enabled   --
vrf1
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1002002   disabled  2002
--
Source            Destination       Origin Status      VNI       Routing   VLAN
VRF
----------------   ---------------  -----  ----------  --------- --------- ----- -
-----
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational  11        enabled   --
vrf1
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational  12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational  1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational  1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational  1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::5  evpn  operational  1002002   disabled  2002
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  11        enabled   --
vrf1
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::2  evpn  operational  1002002   disabled  2002
--
```

```
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  11        enabled   --
vrf1
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::3  evpn  operational  1002002   disabled  2002
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  11        enabled   --
vrf1
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  12        enabled   --
vrf2
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1001001   disabled  1001
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1001002   disabled  1002
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1002001   disabled  2001
--
1920:1680:1:1::1  1920:1680:1:1::4  evpn  operational  1002002   disabled  2002
--
```

Showing detailed information for VTEPs on a VXLAN interface with IPv4 source and destination addresses.

```
switch# show interface vxlan vteps detail
Destination          : 22.22.22.1
Source               : 21.21.21.1
Origin               : static
VRF                  : default
Status               : operational
Nexthops
========
    IP-ADDRESS  INTERFACE  NEXTHOP-MAC
    ----------  ---------  ------------------
      --        1/1/2      11:11:11:11:33:11


switch# show interface vxlan vteps 33.33.33.1
Destination          : 33.33.33.1
Source               : 21.21.21.1
Origin               : evpn
VRF                  : default
Status               : operational
Nexthops
========
    IP-ADDRESS  INTERFACE  NEXTHOP-MAC
    ----------  ---------  ------------------
    2.2.3.1     1/1/1      11:11:11:11:44:11
    2.2.2.1     lag1       11:11:11:11:22:11
    2.2.1.1     vlan21     11:11:11:11:11:11IP
```

Showing detailed information for VTEPs on a VXLAN interface with IPv6 source and destination addresses.

```
switch# show interface vxlan 1

Interface vxlan1 is up
Admin state is up
Description:
Underlay VRF: default
Destination UDP port: 4789
VTEP source IPv4 address:
VTEP source IPv6 address: 1920:1680:1:1::1
Inter vxlan bridging mode: deny

VNI     Routing   VLAN   VRF    VTEP Peers    Origin
---------- ------------ ------ ------------ --------------------------------------
---  --------
11         enabled   --    vrf1  1920:1680:1:1::5   evpn
11         enabled   --    vrf1  1920:1680:1:1::2   evpn
11         enabled   --    vrf1  1920:1680:1:1::3   evpn
11         enabled   --    vrf1  1920:1680:1:1::4   evpn
12         enabled   --    vrf2  1920:1680:1:1::5   evpn
12         enabled   --    vrf2  1920:1680:1:1::2   evpn
12         enabled   --    vrf2  1920:1680:1:1::3   evpn
12         enabled   --    vrf2  1920:1680:1:1::4   evpn
1001001    disabled  1001   --   1920:1680:1:1::5   evpn
1001001    disabled  1001   --   1920:1680:1:1::2   evpn
1001001    disabled  1001   --   1920:1680:1:1::3   evpn
1001001    disabled  1001   --   1920:1680:1:1::4   evpn
1001002    disabled  1002   --   1920:1680:1:1::5   evpn
1001002    disabled  1002   --   1920:1680:1:1::2   evpn
1001002    disabled  1002   --   1920:1680:1:1::3   evpn
1001002    disabled  1002   --   1920:1680:1:1::4   evpn
1002001    disabled  2001   --   1920:1680:1:1::5   evpn
1002001    disabled  2001   --   1920:1680:1:1::2   evpn
1002001    disabled  2001   --   1920:1680:1:1::3   evpn
1002001    disabled  2001   --   1920:1680:1:1::4   evpn
1002002    disabled  2002   --   1920:1680:1:1::5   evpn
1002002    disabled  2002   --   1920:1680:1:1::2   evpn
1002002    disabled  2002   --   1920:1680:1:1::3   evpn
1002002    disabled  2002   --   1920:1680:1:1::4   evpn

Aggregate Statistics
--------------------
 Decap:
    35032601994 input packets     24261116182550 bytes
 Encap:
    68424228547 output packets    47087902492031 bytes
switch# show interface vxlan 1

Interface vxlan1 is up
Admin state is up
Description:
Underlay VRF: default
Destination UDP port: 4789
VTEP source IPv4 address:
VTEP source IPv6 address: 1920:1680:1:1::1
Inter vxlan bridging mode: deny

VNI     Routing   VLAN   VRF    VTEP Peers    Origin
---------- ------------ ------ ------------ --------------------------------------
---  --------
11         enabled   --    vrf1  1920:1680:1:1::5   evpn
11         enabled   --    vrf1  1920:1680:1:1::2   evpn
11         enabled   --    vrf1  1920:1680:1:1::3   evpn
```

```
11         enabled   --    vrf1  1920:1680:1:1::4    evpn
12         enabled   --    vrf2  1920:1680:1:1::5    evpn
12         enabled   --    vrf2  1920:1680:1:1::2    evpn
12         enabled   --    vrf2  1920:1680:1:1::3    evpn
12         enabled   --    vrf2  1920:1680:1:1::4    evpn
1001001    disabled  1001   --   1920:1680:1:1::5    evpn
1001001    disabled  1001   --   1920:1680:1:1::2    evpn
1001001    disabled  1001   --   1920:1680:1:1::3    evpn
1001001    disabled  1001   --   1920:1680:1:1::4    evpn
1001002    disabled  1002   --   1920:1680:1:1::5    evpn
1001002    disabled  1002   --   1920:1680:1:1::2    evpn
1001002    disabled  1002   --   1920:1680:1:1::3    evpn
1001002    disabled  1002   --   1920:1680:1:1::4    evpn
1002001    disabled  2001   --   1920:1680:1:1::5    evpn
1002001    disabled  2001   --   1920:1680:1:1::2    evpn
1002001    disabled  2001   --   1920:1680:1:1::3    evpn
1002001    disabled  2001   --   1920:1680:1:1::4    evpn
1002002    disabled  2002   --   1920:1680:1:1::5    evpn
1002002    disabled  2002   --   1920:1680:1:1::2    evpn
1002002    disabled  2002   --   1920:1680:1:1::3    evpn
1002002    disabled  2002   --   1920:1680:1:1::4    evpn

Aggregate Statistics
--------------------
 Decap:
    35032601994 input packets     24261116182550 bytes
 Encap:
    68424228547 output packets    47087902492031 bytes
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## shutdown

```
shutdown
no shutdown
```

### Description

Disables the VXLAN interface and deletes all VXLAN tunnels, segments, and members on the interface.

The **no** form of this command starts the VXLAN interface and creates all VXLAN tunnels and segments. If members are configured, they are added to the VXLAN segment.

## Examples

Disabling VXLAN interface 1:

```
switch(config)# interface vxlan 1 mode ipv4
switch(config-vxlan-if)# shutdown
```

Enabling VXLAN interface 1:

```
switch(config)# interface vxlan 1 mode ipv4
switch(config-vxlan-if)# no shutdown
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vxlan-if` | Administrators or local user group members with execution rights for this command. |

# source ip

`source ip <IPV4-ADDR>`

## Description

Configures the source IPv4 address for a VXLAN interface. All VXLAN encapsulated packets use this source IP address in the outer IP header.

If you change an existing source IP address, all tunnels with the old source IP address are deleted, and new tunnels are created with the new source IP address.

The **no** form of this command deletes the source IP address for the VXLAN interface and deletes all VXLAN tunnels using this source IP address.

| Parameter | Description |
|---|---|
| *<IPV4-ADDR>* | Specifies the IP address to assign to the VXLAN interface in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. This must be an address assigned to an existing switch interface, either a loopback interface or a layer 3 interface. |

## Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring the loopback IP address as the source IPv4 address:

```
switch(config)# interface loopback 1
switch(config-loopback-if)# ip address 1.1.1.1/24
switch(config)# interface vxlan 1
switch(config-vxlan-if)# source ip 1.1.1.1
```

Configuring a layer 3 interface IP address as the source IPv4 address:

```
switch(config)# interface 1/1/2
switch(config-if)# no shutdown
switch(config-if)# routing  (6300/6400 only)
switch(config-if)# ip address 11.10.10.1/24
switch(config)# interface vxlan 1
switch(config-vxlan-if)# source ip 10.10.10.1
```

Deleting the source IP address for VXLAN interface 1:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# no source ip 10.10.10.1
```

Whenever the VxLAN source IP address or virtual MAC address is changed via the command-line interface or REST API, all the EVPN routes need to be re-advertised with new IPaddresses or MAC address. Thefore, the **clear bgp** command is issued internally for all EVPN neighbors to ensure all EVPN routes get re-advertised.

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11.1000 | The **<IPV6-ADDR>** parameter is introduced. |
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vxlan-if` | Administrators or local user group members with execution rights for this command. |

## source ipv6

`source ipv6 {<IPV6-ADDR>}`

### Description

Configures the source IPv6 address for a VXLAN interface. All VXLAN encapsulated packets use this source IP address in the outer IP header.

If you change an existing source IP address, all tunnels with the old source IP address are deleted, and new tunnels are created with the new source IP address.

The **no** form of this command deletes the source IP address for the VXLAN interface and deletes all VXLAN tunnels using this source IP address.

| Parameter | Description |
|---|---|
| *<IPV6-ADDR>* | Specifies the IP address to assign to the VXLAN interface in IPv6 format (X:X::X:X). This must be an address assigned to an existing switch interface, either a loopback interface or a layer 3 interface. |

### Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring the loopback IP address as the source IPv6 address:

```
switch(config)# interface loopback 1
switch(config-loopback-if)# ipv6 address 1::1/128
switch(config)# interface vxlan 1
switch(config-vxlan-if)# source ipv6 1::11
```

Deleting the source IP address for VXLAN interface 1:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# no source ipv6 1::11
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11.1000 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vxlan-if` | Administrators or local user group members with execution rights for this command. |

## system vlan-client-presence-detect

```
system vlan-client-presence-detect
no system vlan-client-presence-detect
```

### Description

Enables VNI mapped VLANs when detecting the presence of a client. When enabled, VNI mapped VLANs are *up* only if there are authenticated clients on the VLAN, or if the VLAN has statically configured ports and those ports are *up*. When not enabled, VNI mapped VLANs are always *up*.

The **no** form of this command disables detection of clients on VNI mapped VLANs.

### Examples

Enabling detection of clients:

```
switch(config)# system vlan-client-presence-detect
```

Disabling detection of clients:

```
switch(config)# no system vlan-client-presence-detect
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config` | Administrators or local user group members with execution rights for this command. |

## vlan

```
vlan <VLAN-ID>
no vlan <VLAN-ID>
```

### Description

Associates an existing VLAN with a VNI. Only one VLAN can be associated with a VNI and the VNI must have symmetric routing disabled. To change the VLAN associated with a VNI, execute the command `vlan` with a different VLAN ID.

The **no** form of this command removes the specified VLAN from a VNI. Traffic on the specified VLAN is no longer bridged on the VXLAN interface.

| Parameter | Description |
|---|---|
| *<VLAN-ID>* | Specifies the number of an existing VLAN. Range: 2 to 4040. |

### Examples

Assigning VLAN **10** to VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# vlan 10
```

Deleting VLAN **10** from VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
witch(config-vni-1000)# no vlan 10
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vni-<VNI-NUMBER>` | Administrators or local user group members with execution rights for this command. |

## vni

```
vni <VNI-NUMBER>
no vni <VNI-NUMBER>
```

### Description

Creates a VNI (Virtual Network Identifier) for the VXLAN interface and changes to the `config-vni-<VNI-NUMBER>` context. The VNI identifies a VXLAN segment, which acts as a logical network. The VNI can be associated with either a VLAN or VRF.

- When the VNI is associated with a VLAN, the VNI supports asymmetric routing.
- Enable support for asymmetric routing by executing the `routing` command. By default, the VNI is associated with the default VRF. To use another VRF, execute the `vrf` command.

The **no** form of this command deletes the specified VNI from the VXLAN interface. All VXLAN tunnels, VXLAN segments, and members associated with the VNI are deleted.

| Parameter | Description |
|---|---|
| *<VNI-NUMBER>* | Specifies the number for a VNI. Range: 1 to 16777214. |

### Examples

Creating VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)#
```

Deleting VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# no vni 1000
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vxlan-if` | Administrators or local user group members with execution rights for this command. |

## vrf

```
vrf <VRF-NAME>
no vrf <VRF-NAME>
```

### Description

Changes the VRF associated with an L3 VNI after symmetric routing is activated using the `routing` command. The default VRF should not be configured as an EVPN-enabled VRF. If user tries to configure VRF on a VNI that is already associated with a VLAN, an appropriate error is displayed

If a user tries to remove or reconfigure the VRF attached to a VNI while a policy is applied, an appropriate error is displayed.

The **no** form of this command sets the VRF associated with an L3 VNI to the default VRF.

### Examples

Enabling L3 VNI **1000** using VRF **vrf-1**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# routing
switch(config-vni-1000)# vrf vrf-1
```

Setting the VRF on L3 VNI **1000** to the default VRF:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# routing
switch(config-vni-1000)# no vrf vrf-1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vni-<VNI-NUMBER>` | Administrators or local user group members with execution rights for this command. |

## vtep-peer

```
vtep-peer <IPV4-ADDR>
no vtep-peer <IPV4-ADDR>
```

### Description

Adds a VTEP peer to a VNI. The VMI must not have routing enabled. The VTEP peer IP address must be reachable for a VXLAN tunnel to be established.

The **no** form of this command removes a VTEP peer from a VNI, which deletes the VXLAN tunnel to the peer.

| Parameter | Description |
|---|---|
| *<IPV4-ADDR>* | Specifies the IP address of a VTEP peer in IPv4 format (**x.x.x.x**), where **x** is a decimal number from 0 to 255. |

### Examples

Adding VTEP peer **10.10.10.1** to VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# vlan 10
switch(config-vni-1000)# vtep-peer 10.10.10.1
```

Deleting VTEP peer **10.10.10.1** from VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# no vtep-peer 10.10.10.1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vni-<VNI-NUMBER>` | Administrators or local user group members with execution rights for this command. |

## vtep-peer-ipv6

```
vtep-peer-ipv6 <IPV6-ADDR>
no vtep-peer-ipv6 <IPV6-ADDR>
```

### Description

Adds an IPv6 VTEP peer to a VNI. The VMI must not have routing enabled. The VTEP peer IP address must be reachable for a VXLAN tunnel to be established.

The **no** form of this command removes a VTEP peer from a VNI, which deletes the VXLAN tunnel to the peer.

| Parameter | Description |
|---|---|
| *<IPV6-ADDR>* | Specifies the IP address of a VTEP peer in IPv6 format (X:X::X:X). |

### Examples

Adding VTEP peer**12::1** to VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# vlan 10
switch(config-vni-1000)# vtep-peer-ipv6 12::1
```

Deleting VTEP peer **12::1** from VNI **1000**:

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vni 1000
switch(config-vni-1000)# no vtep-peer-ipv6 12::1
```

For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.11.1000 | Command introduced |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vni-<VNI-NUMBER>` | Administrators or local user group members with execution rights for this command. |

## vxlan-counters aggregate

```
vxlan-counters aggregate
no vxlan-counters aggregate
```

### Description

Attaches VXLAN counters to a VXLAN interface. The counters aggregate statistics for packets sent through the interface. Display statistics with the command `show interface vxlan`. Statistics are only displayed once a valid configuration is made on the interface.

### Example

Enabling counters for VXLAN interface 1.

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# vxlan-counters aggregate
```

Disabling counters for VXLAN interface 1.

```
switch(config)# interface vxlan 1
switch(config-vxlan-if)# no vxlan-counters aggregate
```

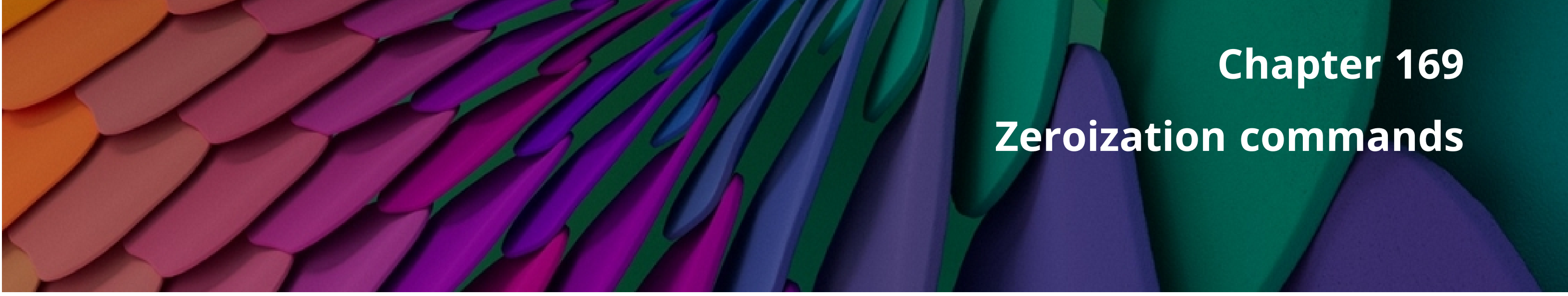
For more information on features that use this command, refer to the VXLAN Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| 6300<br>6400 | `config-vxlan-if` | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |



# Chapter 169

# Zeroization commands

## erase all zeroize

```
erase [all] zeroize
```

### Description

Restores the switch to its factory default configuration. You will be prompted before the procedure starts. Once complete, the switch will restart from the primary image with factory default settings.

### Usage

The **erase all** command is always available in the CLI. On running the **erase all** command, the switch is restored to a factory default settings, but retains the enhanced secure mode settings.

The **erase all zeroize** command is not available in the CLI when enhanced secure mode is enabled. This command restore the switch to a factory default settings. On running the **erase all zeroize** command in enhanced secure mode, displays a notification stating that the command is unavailable in enhanced secure mode.

Back up all data before running this command as all configuration settings will be lost.

### Example

Restoring the switch to factory default configuration, except for the enhance secure mode settings:

```
switch# erase all
This command will erase all data and reset the switch to factory
defaults, with the exception of the secure mode setting. This process
will take several minutes to an hour to complete and the switch will
be unavailable during that time.
Continue (y/n)?
ServiceOS Information:
Version: GT.01.01.0007
Build Date: 2017-12-07 11:48:44 PST
Build ID: ServiceOS:GT.01.01.0007:42c7d15cf7e5:201712071148
SHA: 42c7d15cf7e5af5bf1c7d8764ff673471084c2a4
################ Preparing for zeroization #################
################ Storage zeroization #######################
################ WARNING: DO NOT POWER OFF UNTIL ##########
################ ZEROIZATION IS COMPLETE ##########
################ This should take several minutes ##########
################ to one hour to complete ##########
################ Restoring files ###########################
```

Restoring the switch to factory default configuration only when enhance secure mode settings is disabled.

```
switch# erase all zeroize
This will securely erase all customer data and reset the switch
to factory defaults. This will initiate a reboot and render the
switch unavailable until the zeroization is complete.
This should take several minutes to one hour to complete.
Continue (y/n)? y
The system is going down for zeroization.

...

################ Preparing for zeroization #################


################ Storage zeroization #######################
################ WARNING: DO NOT POWER OFF UNTIL  ##########
################          ZEROIZATION IS COMPLETE ##########
################ This should take several minutes ##########
################ to one hour to complete          ##########


################ Restoring files ###########################

...

We'd like to keep you up to date about:
  * Software feature updates
  * New product announcements
  * Special events
Please register your products now at: https://networkingsupport.hpe.com
```

When you log in after zeroization, you get a prompt to create a password for the administrator account. You can set the password as blank (to set the password as blank, hit enter at the prompt) or type 1 to 32 printable ASCII characters, excluding spaces and question marks (?). For more information on password requirements, see *Password requirements* in the *Security Guide*.

```
switch login: admin
Password:


Please configure the 'admin' user account password.
Enter new password: *****
Confirm new password: *****
```

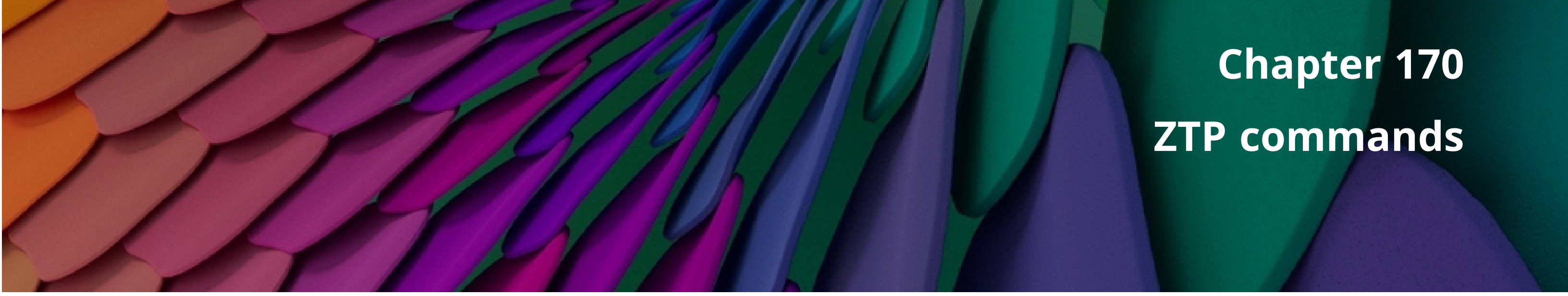
For more information on features that use this command, refer to the Diagnostics and Supportability Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.11.1010 | Introduced **erase all** CLI command |
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Manager (#) | Administrators or local user group members with execution rights for this command. |



# Chapter 170

# ZTP commands

## show ztp information

```
show ztp information
```

### Description

Shows information about Zero Touch Provisioning (ZTP) operations performed on the switch.

### Usage

When a switch configured to use ZTP is booted from a factory default configuration, the switch contacts a DHCP server, which offers options for obtaining files used to provision the switch:

- The IP address of the TFTP server
- The name of the image file
- The name of the configuration file
- The Aruba Central FDQN or IPv4 address
- The HTTP proxy FDQN or IPv4 address

The **show ztp information** command shows the options offered by the DHCP server and the status of the ZTP operation.

The status of the ZTP operation is one of the following:

**Success**

The ZTP operation succeeded.

One of the following is true:

- Both the running configuration and the startup configuration were updated.
- The IP address of the TFTP server was received, but the offer did not include a configuration file or a firmware image file.
- Any combination of vendor encapsulated DHCP options are received as configured, along with the firmware image and switch configuration file.
- Only vendor encapsulated DHCP options are configured and are received accordingly.

**Failed - Custom startup configuration detected**

The switch was booted from a configuration that is not the factory default configuration. For example, the administrator password has been set.

**Failed - Timed out while waiting to receive ZTP options**

Either the switch received the DHCP IPv4 address but no ZTP options were received within 1 minute or ZTP force-provision is triggered and no ZTP options are received within 3 minutes.

**Failed - Detected change in running configuration**

The running configuration was modified by a user while the ZTP operation was in progress.

**Failed - TFTP server unreachable**

The TFTP server is not reachable at the specified IP address.

**Failed - TFTP server information unavailable**

The image file name or config file name is provided without the TFTP server location to fetch the files from and ZTP enters failed state.

**Failed - Invalid configuration file received**

Either the file transfer of the configuration file failed, or the configuration file is invalid (an error occurred while attempting to apply the configuration).

**Failed - Invalid image file received**

Either the file transfer of the firmware image file failed, or the firmware image file is invalid (an error occurred while verifying the image).

In the case of reconnection, connect with a main or alternative location to the COP instance as a user. The current connection is shown in the **Central location** field.

Scenario 1: If the location the device is currently connected on is updated, the system reconnects in order to connect with the new location.

Scenario 2: If the location in which the device is not currently connected on is updated, the DUT does not go through the reconnection process.

## Examples

Showing switch image download in progress after receiving ZTP options:

```
switch# show ztp information
TFTP Server                          : 10.0.0.2
Image File                           : TL_10_02_0001.swi
Configuration File                   : config_file
ZTP Status                           : In-progress - Image download and verification
Aruba Central Location               : secure.arubanetworks.com
Alternative Aruba Central Location: NA
Aruba Central Shared Token           : aruba123
Force-Provision                      : Disabled
HTTP Proxy Location                  : http.proxy.arubanetworks.com
```

Showing switch image download failure after receiving ZTP options:

```
switch# show ztp information
TFTP Server                          : 10.0.0.2
Image File                           : TL_10_02_0001.swi
Configuration File                   : config_file
ZTP Status                           : Failed - Unable to download image
Aruba Central Location               : secure.arubanetworks.com
Alternative Aruba Central Location: NA
Aruba Central Shared Token           : aruba123
Force-Provision                      : Disabled
HTTP Proxy Location                  : http.proxy.arubanetworks.com
```

Showing switch configuration download in progress after receiving ZTP options:

```
switch# show ztp information
TFTP Server                           : 10.0.0.2
Image File                            : TL_10_02_0001.swi
Configuration File                    : config_file
```

```
ZTP Status                           : In-progress - Configuration download
Aruba Central Location               : secure.arubanetworks.com
Alternative Aruba Central Location : NA
Aruba Central Shared Token           : aruba123
Force-Provision                      : Disabled
HTTP Proxy Location                  : http.proxy.arubanetworks.com
```

Showing switch configuration download failure after receiving ZTP options:

```
switch# show ztp information
TFTP Server                          : 10.0.0.2
Image File                           : TL_10_02_0001.swi
Configuration File                   : config_file
ZTP Status                           : Failed - Unable to download configuration
Aruba Central Location               : secure.arubanetworks.com
Alternative Aruba Central Location : NA
Aruba Central Shared Token           : aruba123
Force-Provision                      : Disabled
HTTP Proxy Location                  : http.proxy.arubanetworks.com
```

Showing switch failure to update start-up configuration after downloading configuration received from ZTP options:

```
switch# show ztp information
TFTP Server                         : 10.0.0.2
Image File                          : TL_10_02_0001.swi
Configuration File                  : config_file
ZTP Status                          : Failed - Could not copy to start-up configuration
Aruba Central Location              : secure.arubanetworks.com
Alternative Aruba Central Location: NA
Aruba Central Shared Token          : aruba123
Force-Provision                     : Disabled
HTTP Proxy Location                 : http.proxy.arubanetworks.com
```

In the following example, the ZTP operation succeeded, and both an image file and a configuration file were provided.

```
VSF-10-Mbr# show ztp information
TFTP Server                          : 10.1.84.160
Image File                           : FL_10_06_0001CK.swi
Configuration File                   : 102720-new-setup-config-updated.txt
Status                               : Success
Aruba Central Location               : NA
Alternative Aruba Central Location : NA
Aruba Central Shared Token           : aruba123
Force-Provision                      : Disabled
HTTP Proxy Location                  : NA
VSF-10-Mbr#
```

In the following example, the ZTP option succeeded. A configuration file was not provided, but an image file was provided.

```
VSF-10-Mbr# show ztp information
TFTP Server                    : 10.1.84.160
Image File                     : TL_10_02_0001.swi
Configuration File             : NA
Status                         : Success
Aruba Central Location         : NA
Alternative Aruba Central Location: NA
Aruba Central Shared Token     : aruba123
Force-Provision                : Disabled
HTTP Proxy Location            : NA
VSF-10-Mbr#
```

In the following example, the ZTP operation failed because the TFTP server was unreachable.

```
VSF-10-Mbr# show ztp information
TFTP Server                       : 10.1.84.160
Image File                        : TL_10_02_0001.swi
Configuration File                : 102720-new-setup-config-updated.txt
Status                            : Failed - TFTP server unreachable
Aruba Central Location            : NA
Alternative Aruba Central Location: NA
Aruba Central Shared Token        : NA
Force-Provision                   : Disabled
HTTP Proxy Location               : NA
VSF-10-Mbr#
```

In the following example, the ZTP operation was stopped because the switch did not receive any options from the DHCP server for ZTP within 1 minute of receiving the IP address from the server.

```
VSF-10-Mbr## show ztp information
TFTP Server                       : NA
Image File                        : NA
Configuration File                : NA
Status                            : Failed - Timed out while waiting to receive ZTP
options
Aruba Central Location            : NA
Alternative Aruba Central Location: NA
Aruba Central Shared Token        : NA
Force-Provision                   : Disabled
HTTP Proxy Location               : NA
VSF-10-Mbr#
```

In the following example, the ZTP operation was stopped because the switch was booted from a configuration that was not the factory default configuration.

```
switch# show ztp information
TFTP Server                       : 10.0.0.2
Image File                        : TL_10_02_0001.swi
Configuration File                : ztp.cfg
Status                            : Failed - Custom startup configuration detected
Aruba Central Location            : NA
Alternative Aruba Central Location: NA
Aruba Central Shared Token        : NA
Force-Provision                   : Disabled
HTTP Proxy Location               : NA
```

In the following example, the switch received the image file and the TFTP-sever and config file from the DHCP server for ZTP was successful:

```
switch# show ztp information
TFTP Server                          : 10.0.0.2
Image File                           : TL_10_02_0001.swi
Configuration File                   : ztp.cfg
ZTP Status                           : Success
Aruba Central Location               : NA
Alternative Aruba Central Location: NA
Aruba Central Shared Token           : NA
Force-Provision                      : Disabled
HTTP Proxy Location                  : NA
```

In the following example, the switch received the image file and the TFTP-sever and config file from the DHCP server entered the failed state as teh TFTP server was not reachable:

```
switch# show ztp information
TFTP Server                          : 10.0.0.2
Image File                           : TL_10_02_0001.swi
Configuration File                   : ztp.cfg
ZTP Status                           : Failed - TFTP server unreachable
Aruba Central Location               : NA
Alternative Aruba Central Location: NA
Aruba Central Shared Token           : NA
Force-Provision                      : Disabled
HTTP Proxy Location                  : NA
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

### Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

### Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## ztp force provision

```
ztp force-provision
no ztp force-provision
```

### Description

Starts on-demand ZTP.

## Usage

DHCP options received are processed independent of he current state of configuration on the switch. Previous ZTP TFTP Server, Image File, Configuration File, Aruba Central Location, and HTTP Proxy location options are cleared and the switch sends a DHCP request.

## Examples

In the following example, force-provision is enabled.

```
switch# configure terminal
switch(config)# ztp force-provision
```

In the following example, force-provision status is checked while enabled.

```
switch# show ztp information
TFTP Server                     : 10.0.0.2
Image File                      : TL_10_02_0001.swi
Configuration File              : ztp.cfg
Status                          : Success
Aruba Central Location          : NA
Aruba Central Shared Token      : NA
Force-Provision                 : Enabled
HTTP Proxy Location             : NA
```

In the following example, force-provision is disabled.

```
switch# configure terminal
switch(config)# no ztp force-provision
```

In the following example, force-provision status is checked while disabled.

```
switch# show ztp information
TFTP Server                     : 10.0.0.2
Image File                      : TL_10_02_0001.swi
Configuration File              : ztp.cfg
Status                          : Success
Aruba Central Location          : NA
Aruba Central Shared Token      : NA
Force-Provision                 : Disabled
HTTP Proxy Location             : NA
```

For more information on features that use this command, refer to the Fundamentals Guide for your switch model.

## Command History

| Release | Modification |
|---|---|
| 10.07 or earlier | -- |

## Command Information

| Platforms | Command context | Authority |
|---|---|---|
| All platforms | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

# Chapter 171

# Support and Other Resources

## Accessing HPE Aruba Networking Support

| | |
|---|---|
| HPE Aruba Networking Support Services | https://www.arubanetworks.com/support-services/ |
| AOS-CX Switch Software Documentation Portal | https://www.arubanetworks.com/techdocs/AOS-CX/help_portal/Content/home.htm |
| HPE Aruba Networking Support Portal | https://networkingsupport.hpe.com/home |
| North America telephone | 1-800-943-4526 (US & Canada Toll-Free Number)<br>+1-408-754-1200 (Primary - Toll Number)<br>+1-650-385-6582 (Backup - Toll Number - Use only when all other numbers are not working) |
| International telephone | https://www.arubanetworks.com/support-services/contact-support/ |

Be sure to collect the following information before contacting Support:

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

### Other useful sites

Other websites that can be used to find information:

| | |
|---|---|
| Airheads social forums and Knowledge Base | https://community.arubanetworks.com/ |
| HPE Aruba Networking Hardware Documentation and Translations Portal | https://www.arubanetworks.com/techdocs/hardware/DocumentationPortal/Content/home.htm |

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| HPE Aruba Networking software | https://networkingsupport.hpe.com/downloads |
| Software licensing and Feature Packs | https://lms.arubanetworks.com/ |
| End-of-Life information | https://www.arubanetworks.com/support-services/end-of-life/ |
| HPE Aruba Networking Developer Hub | https://developer.arubanetworks.com/ |

# Accessing Updates

You can access updates from the HPE Aruba Networking Support Portal at https://networkingsupport.hpe.com.

Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

To subscribe to eNewsletters and alerts:

https://networkingsupport.hpe./notifications/subscriptions (requires an active HPE Aruba Networking Support Portal account to manage subscriptions). Security notices are viewable without an HPE Aruba Networking Support Portal account.

# Warranty Information

To view warranty information for your product, go to https://www.arubanetworks.com/support-services/product-warranties/.

# Regulatory Information

To view the regulatory information for your product, view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at https://www.hpe.com/support/Safety-Compliance-EnterpriseProducts

## Additional regulatory information

HPE Aruba Networking is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements, environmental data (company programs, product recycling, energy efficiency), and safety information and compliance data, (RoHS and WEEE). For more information, see https://www.arubanetworks.com/company/about-us/environmental-citizenship/.

# Documentation Feedback

HPE Aruba Networking is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback-switching@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.