



Junos[®] OS

Dynamic Profiles Feature Guide for Subscriber Management

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Junos® OS Dynamic Profiles Feature Guide for Subscriber Management

13.2

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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <http://www.juniper.net/books>.

Supported Platforms

For the features described in this document, the following platforms are supported:

- MX Series

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see the *CLI User Guide*.

Documentation Conventions

Table 1 on page xi defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2 on page xi defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (<i>string1</i> <i>string2</i> <i>string3</i>)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

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- Document or topic name
- URL or page number
- Software release version (if applicable)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>

- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

- [Dynamic Profile Overview on page 3](#)

CHAPTER 1

Dynamic Profile Overview

- [Dynamic Profiles Overview on page 4](#)
- [Dynamic Variables Overview on page 6](#)
- [Junos OS Predefined Variables on page 8](#)
- [Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs on page 26](#)
- [User-Defined Variables on page 32](#)
- [Variable Expressions Overview on page 33](#)
- [Access Profiles and Service Profiles Overview on page 36](#)

Dynamic Profiles Overview

A dynamic profile is a set of characteristics, defined in a type of template, that you can use to provide dynamic subscriber access and services for broadband applications. These services are assigned dynamically to interfaces. The **dynamic-profiles** hierarchy appears at the top level of the CLI hierarchy and contains many Juniper Networks configuration statements that you normally define statically.

Dynamic profile statements appear in the following subhierarchies within the **[edit dynamic-profiles]** hierarchy:

- **class-of-service**
- **firewall**
- **interfaces**
- **predefined-variable-defaults**
- **protocols**
- **routing-instances**
- **routing-options**
- **variables**

This topic covers:

- [Dynamic Profile Interface Support on page 4](#)
- [What Dynamic Profiles Do on page 4](#)
- [How Dynamic Profiles Work on page 5](#)
- [Dynamic Profile Version Creation on page 5](#)
- [Dynamic Profile Semantic Checking on page 6](#)

Dynamic Profile Interface Support

You can identify subscribers statically or dynamically. To identify subscribers statically, you can reference a static VLAN interface in a dynamic profile. To identify subscribers dynamically, you create variables for demux interfaces that are dynamically created when subscribers log in.

What Dynamic Profiles Do

A dynamic profile acts as a kind of template that enables you to create, update, or remove a configuration that includes client access (for example, interface or protocol) or service (for example, class of service (CoS)) attributes or objects that are created dynamically (for example pseudowire). Using these profiles enables you to consolidate all of the common attributes of a client (and eventually a group of clients) and apply the attributes or dynamically created objects simultaneously.

How Dynamic Profiles Work

After profiles are created, they reside on the router in a profile library. These profiles can contain various configurations. For example, you can create a client network access configuration, a services activation configuration, or both. When a router interface receives a join message from a client, the router applies the values configured in the specified dynamic profile to that router interface. The profile can contain interface, CoS, and protocol values that are applied directly to the interface. In addition, the dynamic profile can call input or output firewall filters that reside outside of the dynamic profiles hierarchy.

Dynamic Profile Version Creation

You can create new versions of dynamic profiles that are currently in use by subscribers. Dynamic profile version creation is enabled at the **[edit system]** hierarchy level. When enabled, you can create multiple versions of any dynamic profiles on the router. Any subscriber that logs in following a dynamic profile modification uses the latest version of the dynamic profile. Subscribers that are already active continue to use the older version of the dynamic profile until they log out or their session terminates.

When creating versions of dynamic profiles, keep the following in mind:

- You must enable or disable dynamic profile version creation before creating or using any dynamic profiles on the router. Enabling or disabling dynamic profile version creation after dynamic profiles are configured is not supported.



NOTE: Before you can enable or disable dynamic profile version creation for a router on which any dynamic profiles are configured, you must first remove all dynamic profiles from the router configuration.

- Each version of a dynamic profile is stored in the profile database as a new profile.
- The name of the new profile version is derived by appending a string to the original base dynamic profile name. This string contains two dollar sign (\$) characters to identify the version field of the profile name. These two characters are followed by numerical characters that represent the “version number” of the dynamic profile (for example, 01).
- The version number of the dynamic profile is automatically generated by the system.
- The dynamic profile that you modify is always stored as the latest version. You cannot create a modified dynamic profile and save it as an earlier version. For example, if you modify version three of a dynamic profile while it is in use, the dynamic profile is saved as version four.
- You can only modify the latest version of a dynamic profile.
- The maximum value for the version number is 99999. However, for each profile, only 10 active versions are supported at a time.
- If the dynamic profile version that you modify is not in use by any subscriber, the profile is overwritten with committed changes without creating a new version.

- After reaching the 99999th modified version of a dynamic profile, any further modifications to the dynamic profile result in overwriting that final version. If the final version is in use, any modification attempts fail upon commit.
- You can delete a dynamic profile only when none of its versions are in use.
- The dynamic profile version feature supports graceful restart and unified ISSU.

Dynamic Profile Semantic Checking

Variables are applied to dynamic profiles dynamically and cannot be checked with existing CLI commands. Semantic checking validates some variables in dynamic profiles to help identify potential configuration errors.

Semantic checks are performed during commit and during profile instantiation. Commit time checks ensure that variables appear in the correct location within the dynamic profile. Checks performed before profile instantiation ensure that the values that replace the variables are correct. The checks performed on the values include the following:

- Range validation
- Variable type validation
- Existence of variables where they are mandatory
- Variable matching to regular expressions

A commit time check failure results in an error message being displayed and logged in the `/var/log/messages` file and the commit failing. An instantiation failure results in an error being logged in the `/var/log/messages` file and the profile instantiation failing.

Related Documentation

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Configuring a Dynamic Profile for Client Access on page 43](#)
- [Configuring a Dynamic Profile for Various Levels of Services on page 44](#)
- [Enabling Dynamic Profiles to use Multiple Versions on page 47](#)
- [Dynamic Variables Overview on page 6](#)
- [Subscriber Interface Overview](#)
- [Use Cases for Dynamic Profiles for VPLS Pseudowires](#)

Dynamic Variables Overview

Variables constitute the dynamic component of a dynamic profile. You use variables in dynamic profiles as placeholders for dynamically obtained or dynamically generated information that the dynamic profiles use to configure subscriber interfaces.

- [How Dynamic Variables Work on page 7](#)
- [Default Values for Predefined Variables on page 7](#)
- [Unique Identifier \(UID\) for Parameterized Filters on page 7](#)

How Dynamic Variables Work

Dynamic variables are data placeholders that you define and place in dynamic profiles. When a particular event occurs on an interface (for example, a DHCP client accesses the interface), the dynamic profiles obtain data to fill these placeholders from one of three possible sources—the interface receiving an incoming client data packet, an externally configured server (for example, RADIUS), or a value associated with each user-configurable variable.

For your convenience, Junos OS provides several predefined variables that you can use within a dynamic profile. Most of these variables relate to interface-specific data obtained directly from the interface that receives an incoming client data packets (for example, interface name, interface unit value, and so on). When a client accesses the interface, the router software extracts the necessary interface data, propagates this data to the dynamic profile, and then uses the dynamic profile to configure the interface for the accessing client.

You define user-defined variables for individual dynamic profiles at the **[dynamic-profiles profile-name variables]** hierarchy level. At this hierarchy level, you create an association between a variable value (for example, `$junos-igmp-version`) that appears in the body of the dynamic profile and data associated with that call value that is managed in an externally configured server (for example, a RADIUS VSA managed on a RADIUS server) or defined as a value in the **variables** stanza. When an event occurs on an interface to trigger the instantiation of a dynamic profile for the interface, Junos OS obtains values for each variable from an external server (for example, from RADIUS authentication and authorization VSAs) during the subscriber authentication process. At run time, the variables are replaced by these actual values and are used to configure the subscriber interface.

Default Values for Predefined Variables

You can optionally configure default values for many of the predefined variables. If the external RADIUS server is not available or the VSA does not contain a value for the predefined variable, Junos OS uses the default values.

When a default value is configured for a variable and RADIUS also returns a value, the system uses the value from RADIUS instead.

Unique Identifier (UID) for Parameterized Filters

You can optionally configure a unique identifier (UID) for parameterized filters in dynamic profiles created for services. The generated UIDs enable you to identify and configure separate parameter values for filters with the same variable name. In addition, assigning a UID improves performance of the router.

For service profiles, you can request the generation of an UID for a user-defined variable by including the **uid** statement at the **[dynamic-profiles profile-name variables]** hierarchy level. You then reference the variable name in the filter. To enable selection of a particular filter in a dynamic profile that contains multiple variables of the same parameter and criteria type, you must indicate that the variable refers to a UID. To configure, include the **uid-reference** statement at the **[dynamic-profiles profile-name variables]** hierarchy level.

For example, if the variable **\$in-filter** receives the value of “filter1” from RADIUS, the filter definition named **\$filter** is used.

Related Documentation

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Configuring a Dynamic Profile for Client Access on page 43](#)
- [Configuring a Dynamic Profile for Various Levels of Services on page 44](#)
- [Junos OS Predefined Variables on page 8](#)
- [User-Defined Variables on page 32](#)
- [Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs on page 26](#)
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- [Dynamic Profiles Overview on page 4](#)
- [Subscriber Interface Overview](#)
- [Example: Firewall Dynamic Profile on page 70](#)
- [Example: IGMP Dynamic Profile on page 69](#)
- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework](#)

Junos OS Predefined Variables

Junos OS contains several predefined variables. The dynamic profile obtains and replaces data for these variables from an incoming client data packet and configuration (local and RADIUS). These variables are predefined—you use them in the body of a dynamic profile without first having to define the variables at the **[dynamic-profiles profile-name variables]** hierarchy level. [Table 3 on page 8](#) provides a list of predefined variables, their descriptions, and where in the Junos OS hierarchy you can configure them.

Table 3: Junos OS Predefined Variables and Definitions

Variable	Definition
Access and Access-Internal Routes	
\$junos-framed-route-cost	Cost metric of an IPv4 access route. You specify this variable at the [edit dynamic-profiles profile-name routing-options access route address] hierarchy level for the metric statement.
\$junos-framed-route-distance	Distance of an IPv4 access route. You specify this variable at the [edit dynamic-profiles profile-name routing-options access route address] hierarchy level for the preference statement.

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-framed-route-ip-address-prefix	Route prefix of an IPv4 access route. You specify this variable at the [edit dynamic-profiles profile-name routing-options access] hierarchy level for the route statement.
\$junos-framed-route-ipv6-address-prefix	Route prefix of an IPv6 access route. You specify this variable at the [edit dynamic-profiles profile-name routing-options access] hierarchy level for the route statement.
\$junos-framed-route-ipv6-cost	Cost metric of an IPv6 access route. You specify this variable with the metric statement at the [edit dynamic-profiles profile-name routing-instances \$junos-routing-instance routing-options rib \$junos-ipv6-rib access route \$junos-framed-route-ipv6-address-prefix] hierarchy level.
\$junos-framed-route-ipv6-distance	Distance of an IPv6 access route. You specify this variable with the preference statement at the [edit dynamic-profiles profile-name routing-instances \$junos-routing-instance routing-options rib \$junos-ipv6-rib access route \$junos-framed-route-ipv6-address-prefix] hierarchy level.
\$junos-framed-route-ipv6-nexthop	IPv6 next-hop address of an access route. You specify this variable at the [edit dynamic-profiles profile-name routing-options access route address] hierarchy level for the next-hop statement.
\$junos-framed-route-ipv6-tag	Tag value of an IPv6 access route. You specify this variable with the tag statement at the [edit dynamic-profiles profile-name routing-instances \$junos-routing-instance routing-options rib \$junos-ipv6-rib access route \$junos-framed-route-ipv6-address-prefix] hierarchy level.
\$junos-framed-route-nexthop	IPv4 next-hop address of an access route. You specify this variable at the [edit dynamic-profiles profile-name routing-options access route address] hierarchy level for the next-hop statement.
\$junos-framed-route-tag	Tag value of an IPv4 access route. You specify this variable at the [edit dynamic-profiles profile-name routing-options access route address] hierarchy level for the tag statement.

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-interface-name	<p>Logical interface of an access-internal route. DHCP or PPP supplies this information when the subscriber logs in. You specify this variable at the [edit dynamic-profiles <i>profile-name</i> routing-options access-internal route address] hierarchy level for the qualified-next-hop statement.</p> <p>This variable is also used for creating dynamic IP demux interfaces.</p>
\$junos-ipv6-rib	<p>Routing table for an IPv6 access route. You specify this variable with the rib statement at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options] hierarchy level.</p> <p>You can use this variable to specify a nondefault routing instance for the route.</p>
\$junos-subscriber-ip-address	<p>IP address of a subscriber identified in an access-internal route. You specify this variable at the [edit dynamic-profiles <i>profile-name</i> routing-options access-internal] hierarchy level for the route statement.</p> <p>This variable is also used for creating dynamic IP demux interfaces.</p>
\$junos-subscriber-mac-address	<p>MAC address for a subscriber identified in an access-internal route. You specify this variable at the [edit dynamic-profiles <i>profile-name</i> routing-options access-internal route address qualified-next hop underlying-interface] hierarchy level for the mac-address statement.</p>
Dynamic Protocols	
\$junos-igmp-access-group-name	Specifies the access list to use for the source (S) filter.
\$junos-igmp-access-source-group-name	Specifies the access list to use for the source-group (S,G) filter.
\$junos-igmp-enable	<p>Ensures that IGMP is not disabled on the interface by an AAA-based authentication and management method (for example, RADIUS). You specify this variable at the [dynamic-profiles <i>profile-name</i> protocols igmp] hierarchy level for the interface statement.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
<code>\$junos-igmp-immediate-leave</code>	Enables IGMP immediate leave on the interface. You specify this variable at the [dynamic-profiles <i>profile-name</i> protocols igmp] hierarchy level for the interface statement.
<code>\$junos-igmp-version</code>	IGMP version configured in a client access profile. Junos OS obtains this information from the RADIUS server when a subscriber accesses the router. The version is applied to the accessing subscriber when the profile is instantiated. You specify this variable at the [dynamic-profiles <i>profile-name</i> protocols igmp] hierarchy level for the interface statement.
<code>\$junos-interface-name</code>	<p>Name of the dynamic interface to which the subscriber access client connects. Its use is in dynamically enabling IGMP on the subscriber interface. You specify this variable at the [dynamic-profiles <i>profile-name</i> protocols igmp] hierarchy level for the interface statement.</p> <p>The interface name is derived from concatenating the <code>\$junos-interface-afd-name</code> and the <code>\$junos-underlying-interface-unit</code> variables obtained when a subscriber is created dynamically at the [dynamic-profiles <i>profile-name</i> interfaces] hierarchy level.</p>
<code>\$junos-ipv6-ndra-prefix</code>	Prefix value for the router advertisement interface. Junos OS obtains this information from the RADIUS server when a subscriber accesses the router. The prefix value is applied to the accessing subscriber when the profile is instantiated. You specify this variable at the [dynamic-profiles <i>profile-name</i> protocols router-advertisement interface <i>\$junos-interface-name</i>] hierarchy level.
<code>\$junos-mld-access-group-name</code>	Specifies the access list to use for the group (G) filter.
<code>\$junos-mld-access-source-group-name</code>	Specifies the access list to use for the source-group (S,G) filter.
<code>\$junos-mld-enable</code>	Ensures that MLD is not disabled on the interface by an AAA-based authentication and management method (for example, RADIUS). You specify this variable at the [dynamic-profiles <i>profile-name</i> protocols mld] hierarchy level for the interface statement.

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-mld-immediate-leave	Enables MLD immediate leave on the interface. You specify this variable at the [dynamic-profiles profile-name protocols mld] hierarchy level for the interface statement.
\$junos-mld-version	MLD version configured in a client access profile. Junos OS obtains this information from the RADIUS server when a subscriber accesses the router. The version is applied to the accessing subscriber when the profile is instantiated. You specify this variable at the [dynamic-profiles profile-name protocols mld] hierarchy level for the interface statement.
Dynamic CoS — Traffic-Control Profile Parameters	
\$junos-cos-adjust-minimum	<p>Minimum adjusted shaping rate configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the adjust-minimum statement at the [edit dynamic-profiles profile-name class-of-service traffic-control-profiles profile-name] hierarchy level.</p>
\$junos-cos-byte-adjust	<p>Byte adjustment value configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the bytes option with the overhead-accounting statement at the [edit dynamic-profiles profile-name class-of-service traffic-control-profiles profile-name] hierarchy level.</p>
\$junos-cos-byte-adjust-cell	<p>Overhead bytes when downstream ATM traffic is in cell-mode.</p> <p>NOTE: Do not configure the \$junos-cos-byte-adjust-cell variable when the \$junos-cos-byte-adjust variable is configured.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-byte-adjust-frame	<p>Overhead bytes when downstream ATM traffic is in frame-mode.</p> <p>NOTE: Do not configure the \$junos-cos-byte-adjust-frame variable when the \$junos-cos-byte-adjust variable is configured.</p>
\$junos-cos-delay-buffer-rate	<p>Delay-buffer rate configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the delay-buffer-rate statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>
\$junos-cos-excess-rate	<p>Excess rate configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the excess-rate statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>
\$junos-cos-excess-rate-high	<p>Rate configured for excess high-priority traffic in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the excess-rate-high statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-excess-rate-low	<p>Rate configured for excesslow-priority traffic in a traffic-control profile in a dynamic profile for subscriber access. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the excess-rate-low statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>
\$junos-cos-guaranteed-rate	<p>Guaranteed rate configured in a traffic-control profile in a dynamic profile Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the guaranteed-rate statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>
\$junos-cos-guaranteed-rate-burst	<p>Burst size for the guaranteed rate that is configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable with the burst-size option in the guaranteed-rate statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-scheduler-map	<p>Scheduler-map name configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the scheduler-map statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p> <p>NOTE: The scheduler map can be defined dynamically (at the [edit dynamic-profiles <i>profile-name</i> class-of-service scheduler-maps] hierarchy level) or statically (at the [edit class-of-service scheduler-maps] hierarchy level).</p>
\$junos-cos-shaping-mode	<p>Shaping mode configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the overhead-accounting statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>
\$junos-cos-shaping-rate	<p>Shaping rate configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the shaping-rate statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-shaping-rate-burst	<p>Burst size for the shaping rate configured in a traffic-control profile in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable with the burst-size option in the shaping-rate statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service traffic-control-profiles <i>profile-name</i>] hierarchy level.</p>
\$junos-cos-shaping-rate-excess-high	Shaping rate configured for excess high-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-excess-high-burst	Shaping rate burst size configured for excess high-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-excess-low	Shaping rate configured for excess low-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-excess-low-burst	Shaping rate burst size configured for excess low-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-priority-high	Shaping rate configured for high-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-priority-high-burst	Shaping rate burst size configured for high-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-shaping-rate-priority-low	Shaping rate configured for low-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-priority-low-burst	Shaping rate burst size configured for low-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-priority-medium	Shaping rate configured for medium-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-shaping-rate-priority-medium-burst	Shaping rate burst size configured for medium-priority traffic in a traffic-control profile for a dynamic interface set or dynamic ACI interface set at a household level. Specifying this variable in a traffic-control profile for a dynamic subscriber interface is prohibited.
\$junos-cos-traffic-control-profile	<p>Traffic-control profile configured in a dynamic profile for subscriber access. The Junos OS obtains the profile information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the traffic-control-profiles statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service] hierarchy level.</p>
Dynamic CoS — Scheduler Parameters	
\$junos-cos-scheduler	<p>Name of a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable at the [edit dynamic-profiles <i>profile-name</i> class-of-service schedulers] hierarchy level.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-scheduler-bs	<p>Buffer size as a percentage of total buffer, specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the buffer-size statement with the percent option at the [edit dynamic-profiles <i>profile-name</i> class-of-service schedulers <i>scheduler-name</i>] hierarchy level.</p>
\$junos-cos-scheduler-pri	<p>Packet-scheduling priority value specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the priority statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service schedulers <i>scheduler-name</i>] hierarchy level.</p>
\$junos-cos-scheduler-dropfile-any	<p>Name of the drop profile for random early detection (RED) for loss-priority level any specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the drop-profile statement at the [edit dynamic-profiles <i>profile-name</i> class-of-service schedulers <i>scheduler-name</i> drop-profile-map loss-priority any protocol any] hierarchy level.</p> <p>NOTE: The drop profile must be configured statically (at the [edit class-of-service drop-profiles] hierarchy level).</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-scheduler-dropfile-high	<p>Name of the drop profile for random early detection (RED) for loss-priority level high specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the drop-profile statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name drop-profile-map loss-priority high protocol any] hierarchy level.</p> <p>NOTE: The drop profile must be configured statically (at the [edit class-of-service drop-profiles] hierarchy level).</p>
\$junos-cos-scheduler-dropfile-low	<p>Name of the drop profile for random early detection (RED) for loss-priority level low specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the drop-profile statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name drop-profile-map loss-priority low protocol any] hierarchy level.</p> <p>NOTE: The drop profile must be configured statically (at the [edit class-of-service drop-profiles] hierarchy level) for loss-priority low.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-scheduler-dropfile-medium-high	<p>Name of the drop profile for random early detection (RED) for loss-priority level medium-high specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the drop-profile statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name drop-profile-map loss-priority medium-high protocol any] hierarchy level.</p> <p>NOTE: The drop profile must be configured statically (at the [edit class-of-service drop-profiles] hierarchy level).</p>
\$junos-cos-scheduler-dropfile-medium-low	<p>Name of the drop profile for random early detection (RED) for loss-priority level medium-low specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the drop-profile statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name drop-profile-map loss-priority medium-low protocol any] hierarchy level.</p> <p>NOTE: The drop profile must be configured statically (at the [edit class-of-service drop-profiles] hierarchy level).</p>
\$junos-cos-scheduler-excess-priority	<p>Priority value of the excess rate specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the excess-priority statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name] hierarchy level.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-cos-scheduler-excess-rate	<p>Value of the excess rate specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the excess-rate statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name] hierarchy level.</p>
\$junos-cos-scheduler-shaping-rate	<p>Value of the shaping rate specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the shaping-rate statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name] hierarchy level.</p>
\$junos-cos-scheduler-tx	<p>Transmit rate specified for a scheduler configured in a dynamic profile. Junos OS obtains this information from the RADIUS server when a subscriber authenticates over the static or dynamic subscriber interface to which the dynamic profile is attached.</p> <p>You reference this variable in the transmit-rate statement at the [edit dynamic-profiles profile-name class-of-service schedulers scheduler-name] hierarchy level.</p>
Dynamic Connectivity Fault Management Parameters	
\$junos-action-profile	Name of the action profile configured in a dynamic profile.
\$junos-ccm-interval	Continuity check interval time configured in a dynamic profile.
\$junos-loss-threshold	The number of continuity check messages lost before marking the remote MEP as down, configured in a dynamic profile.
\$junos-ma-name-format	Name of the maintenance association name format configured in a dynamic profile.
\$junos-md-name-format	Name of the maintenance domain format configured in a dynamic profile.

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-ma-name	Name of the maintenance association configured in a dynamic profile.
\$junos-md-level	Value of 'Level', configured in a dynamic profile.
\$junos-md-name	Name of the maintenance domain configured in a dynamic profile.
\$junos-mep-id	The 'MEP' value configured in the dynamic profile.
\$junos-remote-mep-id	The 'Remote MEP' value configured in the dynamic profile.
Filters — RADIUS-obtained Policies	
\$junos-input-filter	Attaches a filter based on RADIUS VSA 26-10 (Ingress-Policy-Name) or RADIUS attribute 11 (Filter-ID) to the interface.
\$junos-input-ipv6-filter	Attaches a filter based on RADIUS VSA 26-106 (IPv6-Ingress-Policy-Name) to the interface.
\$junos-output-filter	Attaches a filter based on RADIUS VSA 26-11 (Egress-Policy-Name) to the interface.
\$junos-output-ipv6-filter	Attaches a filter based on RADIUS VSA 26-107 (IPv6-Egress-Policy-Name) to the interface.
Subscriber Interfaces — Dynamic Demux Interfaces	
\$junos-interface-ifd-name	<p>Name of the device to which the subscriber access client connects. All interfaces are created on this device. Its primary use is in creating single or multiple subscribers on a statically created interface. You specify this variable at the [dynamic-profiles profile-name interfaces] hierarchy level.</p> <p>When creating a logical underlying interface for a dynamic VLAN demux interface, you must also specify this variable at the [dynamic-profiles profile-name interfaces demux0 unit \$junos-interface-unit demux-options underlying-interface] hierarchy level.</p>
\$junos-interface-unit	Creates a unit number assigned to the logical interface. The router supplies this information when the subscriber accesses the network. You specify this variable at the [dynamic-profiles profile-name interfaces interface-name] hierarchy level for the unit statement.

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-ipv6-address	Selects the IPv6 address of the interface the subscriber uses. You specify this variable at the [edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>], [edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family <i>family</i>], [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i>], and [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>] hierarchy level for the address statement.
\$junos-loopback-interface	Selects the loopback interface the subscriber uses. You specify this variable at the [dynamic profiles <i>profile-name</i> interfaces demux0 unit "\$junos-interface-unit" family inet] hierarchy level for the unnumbered-address statement.
\$junos-preferred-source-address	Selects the preferred source address associated with the loopback address used for the subscriber. You specify this variable at the [dynamic profiles <i>profile-name</i> interfaces demux0 unit "\$junos-interface-unit" family inet unnumbered-address "\$junos-loopback-interface"] hierarchy level for the preferred-source-address statement.
\$junos-subscriber-ip-address	<p>IP address of the subscriber. You specify this variable at the [dynamic-profiles <i>profile-name</i> interfaces <i>demux0</i> unit family <i>inet</i> demux-source] hierarchy level.</p> <p>This variable is also used for creating access-internal routes.</p>
\$junos-subscriber-ipv6-address	IPv6 address for subscriber. You specify this variable at the [dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>inet6</i> demux-source] hierarchy level.
\$junos-subscriber-ipv6-multi-address	<p>Expands the demux-source into multiple addresses; for example, the IPv6 prefix and /128 address for the subscriber.</p> <p>You specify this variable at the [dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>inet6</i> demux-source] hierarchy level.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-underlying-interface	<p>Creates a logical underlying interface for a dynamic IP demux interface. The client logs in on this interface. You specify this variable at the [dynamic profiles <i>profile-name</i> interfaces demux0 unit "<i>\$junos-interface-unit</i>" demux-options] hierarchy level for the underlying-interface statement.</p> <p>When configured, the underlying interface is used to determine the \$junos-underlying-interface, \$junos-underlying-interface-unit, and \$junos-ifd-name variables. For example, if the receiving logical interface is ge-0/0/0.1, the \$junos-underlying-interface variable is set to ge-0/0/0 and the \$junos-underlying-interface-unit variable is set to 1.</p> <p>This variable is also used for creating access-internal routes.</p>
Subscriber Interfaces — Static VLAN Interfaces	
\$junos-interface-ifd-name	<p>Name of the device to which the subscriber access client connects. All interfaces are created on this device. Its primary use is in creating single or multiple subscribers on a statically created interface. You specify this variable at the [dynamic-profiles <i>profile-name</i> interfaces] hierarchy level.</p>
\$junos-underlying-interface-unit	<p>Obtains the unit number for the underlying interface. It specifies the use of the underlying interface for the subscriber. You specify this variable at the [dynamic-profiles <i>profile-name</i> interfaces <i>\$junos-interface-ifd-name</i>] hierarchy for the unit statement.</p>

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
Subscriber Interfaces — Dynamic PPPoE Interfaces	
<code>\$junos-interface-unit</code>	Specifies the logical unit number when the router dynamically creates a PPPoE logical interface. The <code>\$junos-interface-unit</code> predefined variable is dynamically replaced with the unit number supplied by the network when the PPPoE subscriber logs in. You specify this variable at the <code>[edit dynamic-profiles profile-name interfaces pp0]</code> hierarchy level for the <code>unit</code> statement.
<code>\$junos-underlying-interface</code>	Specifies the name of the underlying Ethernet interface on which the router dynamically creates the PPPoE logical interface. The <code>\$junos-underlying-interface</code> predefined variable is dynamically replaced with the name of the underlying interface supplied by the network when the PPPoE subscriber logs in. You specify this variable at the <code>[edit dynamic-profiles profile-name interfaces pp0 unit "\$junos-interface-unit" pppoe-options]</code> hierarchy level for the <code>underlying-interface</code> statement.
Subscriber Interfaces — Dynamic Interface Sets	
<code>\$junos-interface-set-name</code>	Name of an interface set configured in a dynamic profile. To represent the name of a dynamically created agent circuit identifier (ACI) interface set, use the <code>\$junos-interface-set-name</code> predefined variable in the <code>interface-set</code> statement at the <code>[edit dynamic-profiles profile-name interfaces]</code> hierarchy level.
<code>\$junos-svlan-interface-set-name</code>	Locally generated interface set name for use by dual-tagged VLAN interfaces based on the outer tag of the dual-tagged VLAN. The format of the generated variable is <code>physical_interface_name - outer_VLAN_tag</code> .
Wholesale Networking	

Table 3: Junos OS Predefined Variables and Definitions (*continued*)

Variable	Definition
\$junos-interface-name	<p>Name of the dynamic interface to which the subscriber access client connects. Its use is in identifying the subscriber interface. You specify this variable at the [dynamic-profiles profile-name routing-instance \$junos-routing-instance] hierarchy level for the interface statement.</p> <p>The interface name is derived from concatenating the \$junos-interface-ifd-name and the \$junos-underlying-interface-unit variables obtained when a subscriber is created dynamically at the [dynamic-profiles profile-name routing-instance \$junos-routing-instance interface] hierarchy level.</p>
\$junos-routing-instance	<p>Name of the routing instance to which the subscriber is assigned. This variable triggers a return value from the RADIUS server for Virtual-Router (VSA 26–1).</p> <p>You reference this variable in the statement at the [dynamic-profiles profile-name] hierarchy level for the routing-instance statement.</p>

Related Documentation

- [Dynamic Variables Overview on page 6](#)
- [Configuring Predefined Dynamic Variables in Dynamic Profiles on page 51](#)
- [Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs on page 26](#)
- [User-Defined Variables on page 32](#)

Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs

Table 4 on page 26 lists the RADIUS attributes and Juniper Networks VSAs and their corresponding Junos OS predefined variables that are used in dynamic profiles. When the router instantiates a dynamic profile following subscriber access, the Junos OS uses the predefined variable to specify the RADIUS attribute or VSA for the information obtained from the RADIUS server.

Table 4: RADIUS Attributes and Corresponding Junos OS Predefined Variables

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
RADIUS Attribute			
Framed-IP-Address (8)	\$junos-framed-route-ip-address	Address for the client	No

Table 4: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
Filter-ID (11)	\$junos-input-filter NOTE: Variable is also used for VSA 26–10.	Input filter to apply to client IPv4 interface	Yes
Framed-Route (22)	\$junos-framed-route-ip-address-prefix	(Subattribute 1): Route prefix for access route	No
	\$junos-framed-route-nexthop	(Subattribute 2): Next hop address for access route	No
	\$junos-framed-route-cost	(Subattribute 3): Metric for access route	No
	\$junos-framed-route-distance	(Subattribute 5): Preference for access route	No
	\$junos-framed-route-tag	(Subattribute 6): Tag for access route	No
Framed-IPv6-Prefix (97)	\$junos-ipv6-ndra-prefix	Prefix value in IPv6 Neighbor Discovery route advertisements	No
Framed-IPv6-Route (99)	\$junos-framed-route-ipv6-address-prefix	(Subattribute 1): Framed IPv6 route prefix configured for the client	No
	\$junos-framed-route-ipv6-cost	(Subattribute 3): Metric for access route	No
	\$junos-framed-route-ipv6-distance	(Subattribute 5): Preference for access route	No
	\$junos-framed-route-ipv6-nexthop	(Subattribute 2): IPv6 routing information configured for the client	No
	\$junos-framed-route-ipv6-tag	(Subattribute 6): Tag for access route	No
Juniper Networks VSA			
Virtual-Router (26–1)	\$junos-routing-instance	Routing instance to which subscriber is assigned	No

Table 4: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
Ingress-Policy-Name (26–10)	\$junos-input-filter NOTE: Variable is also used for RADIUS attribute 11.	Input filter to apply to client IPv4 interface	Yes
Egress-Policy-Name (26–11)	\$junos-output-filter	Output filter to apply to client IPv4 interface	Yes
IGMP-Enable (26–23)	\$junos-igmp-enable	Enable or disable IGMP on client interface	Yes
IGMP-Access-Name (26–71)	\$junos-igmp-access-group-name	Access list to use for the group (G) filter	Yes
IGMP-Access-Src-Name (26–72)	\$junos-igmp-access-source-group-name	Access List to use for the source group (S,G) filter	Yes
MLD-Access-Name (26–74)	\$junos-mld-access-group-name	Access list to use for the group (G) filter	Yes
MLD-Access-Src-Name (26–75)	\$junos-mld-access-source-group-name	Access List to use for the source group (S,G) filter	Yes
MLD-Version (26–77)	\$junos-mld-version	MLD protocol version	Yes
IGMP-Version (26–78)	\$junos-igmp-version	IGMP protocol version	Yes
IGMP-Immediate-Leave (26–97)	\$junos-igmp-immediate-leave	IGMP immediate leave	Yes
MLD-Immediate-Leave (26–100)	\$junos-mld-immediate-leave	MLD immediate leave	Yes
IPv6-Ingress-Policy-Name (26–106)	\$junos-input-ipv6-filter	Input filter to apply to client IPv6 interface	Yes
IPv6-Egress-Policy-Name (26–107)	\$junos-output-ipv6-filter	Output filter to apply to client IPv6 interface	Yes
CoS-Traffic-Control-Profile-Parameter-Type (26–108)	\$junos-cos-scheduler-map	(T01: Scheduler-map name) Name of scheduler map configured in traffic-control profile	Yes

Table 4: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
	\$junos-cos-shaping-rate	(T02: Shaping rate) Shaping rate configured in traffic-control profile	Yes
	\$junos-cos-guaranteed-rate	(T03: Guaranteed rate) Guaranteed rate configured in traffic-control profile	Yes
	\$junos-cos-delay-buffer-rate	(T04: Delay-buffer rate) Delay-buffer rate configured in traffic-control profile	Yes
	\$junos-cos-excess-rate	(T05: Excess rate) Excess rate configured in traffic-control profile	Yes
	\$junos-cos-traffic-control-profile	(T06: Traffic-control profile) Name of the traffic-control profile configured in a dynamic profile	Yes
	\$junos-cos-shaping-mode	(T07: Shaping mode) CoS shaping mode configured in a dynamic profile	Yes

Table 4: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
	\$junos-cos-byte-adjust	(T08; Byte adjust) Byte adjustments configured for the shaping mode in a dynamic profile	Yes
	\$junos-cos-adjust-minimum	(T09; Adjust minimum) Minimum adjusted value allowed for the shaping rate in a dynamic profile	Yes
	\$junos-cos-excess-rate-high	(T10; Excess rate high) Excess rate configured for high-priority traffic in a dynamic profile	Yes
	\$junos-cos-excess-rate-low	(T11; Excess rate low) Excess rate configured for low-priority traffic in a dynamic profile	Yes
	\$junos-cos-shaping-rate-burst	(T12; Shaping rate burst) Burst size configured for the shaping rate in a dynamic profile	Yes
	\$junos-cos-guaranteed-rate-burst	(T13; Guaranteed rate burst) Burst size configured for the guaranteed rate in a dynamic profile	Yes
Qos-Set-Name (26–130)	\$junos-interface-set-name	Name of an interface set configured in a dynamic profile	Yes
CoS-Scheduler-Pmt-Type (26–146)	\$junos-cos-scheduler	(Null: Scheduler name) Name of scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-tx	(T01: CoS scheduler transmit rate) Transmit rate for scheduler configured in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Rate

Table 4: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
	\$junos-cos-scheduler-bs	(T02: CoS scheduler buffer size) Buffer size for scheduler configured in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Temporal
	\$junos-cos-scheduler-pri	(T03: CoS scheduler priority) Packet-scheduling priority for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-low	(T04: CoS scheduler drop-profile low) Name of drop profile for RED loss-priority level low for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-medium-low	(T05: CoS scheduler drop-profile medium-low) Name of drop profile for RED loss-priority level medium-low for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-medium-high	(T06: CoS scheduler drop-profile medium-high) Name of drop profile for RED loss-priority level medium-high for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-high	(T07: CoS scheduler drop-profile high) Name of drop profile for RED loss-priority level high for scheduler configured in a dynamic profile	Yes

Table 4: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
	\$junos-cos-scheduler-dropfile-any	(T08: CoS scheduler drop-profile any) Name of drop profile for RED loss-priority level any for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-excess-rate	(T09: CoS scheduler excess rate) Excess rate configured for a scheduler in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Proportion
	\$junos-cos-scheduler-shaping-rate	(T10: CoS scheduler shaping rate) Shaping rate configured for a scheduler in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Rate
	\$junos-cos-scheduler-excess-priority	(T11: CoS scheduler excess priority) Excess priority configured for a scheduler in a dynamic profile	Yes

- Related Documentation**
- [Dynamic Variables Overview on page 6](#)
 - [Configuring Predefined Dynamic Variables in Dynamic Profiles on page 51](#)
 - [Junos OS Predefined Variables on page 8](#)

User-Defined Variables

In service profiles, the Junos OS enables you to configure custom variables at the **[dynamic-profiles *profile-name* variables]** hierarchy level and associate those variables with supported RADIUS VSAs. The dynamic profile obtains and replaces data for these variables from an external server (for example, from RADIUS authentication and authorization VSAs) during the subscriber authentication process. At run time, the variables are replaced by these actual values (obtained from default information on the router or from the RADIUS server) and are used to configure the subscriber interface.

For a complete list of supported RADIUS VSAs for which you can create variable associations, see *RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework*.

You can also configure the user-defined variables with a default value. The default value provides a standalone configuration for the associated statement or a backup for the statement configuration if the RADIUS server is inaccessible or the VSA attribute does not contain a value.

**Related
Documentation**

- [Dynamic Profiles Overview on page 4](#)
- [Configuring User-Defined Dynamic Variables in Dynamic Profiles on page 52](#)
- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework](#)
- [Junos OS Predefined Variables on page 8](#)

Variable Expressions Overview

Junos OS enables you to create expressions—groups of arithmetic operators, string operators, and operands—for use as variables within dynamic profiles. You configure variable expressions at the **[dynamic-profiles profile-name variables]** hierarchy level. At run time, the variable expressions are calculated and used as variable values to configure dynamic subscriber interfaces.

When configuring expressions in dynamic profiles, you must adhere to the following rules:

- You can configure expressions only within a variable stanza of a dynamic profile.
- Dynamic profiles that contain expressions must be used only for service activation.
- You can assign expressions only to user-defined variables. You cannot assign expressions to internal variables or predefined variables.
- Expression values are given precedence over default values.
- Entire expressions must be contained within quotation marks (" ").
- Strings within the expressions must be quoted within single quotation marks (' ') and the single quotation marks can contain only strings.
- White space is treated as a delimiter for all operands and operators. Strings containing spaces that you create within expressions are treated as single strings and include any leading or trailing white space. For example:

```
dynamic-profiles {
  service profile {
    variables {
      scheduler-name;
      video-filter equals " 'Filter 1' " # Everything within the single quotation marks is
      considered a string, including the leading and trailing white space
    }
  }
}
```

- The expression must be either all arithmetic operators or all string operators; mixing arithmetic operators and string operators is not allowed unless properly converted to the correct type.

- Expressions can refer to other system predefined variables or other user-defined variables. However, no circular referencing between variables is allowed. For example, the following reference is incorrect:

```
dynamic-profiles {
  Service_Profile_1 {
    variables {
      scheduler-name;
      transmit-rate2 equals " ( $transmit-rate1 * 2)/3" # refers to transmit-rate1
      transmit-rate1 equals " ( $transmit-rate2 * 2)/3" # refers to transmit-rate2
    }
  }
}
```

- Any mandatory variable that does not contain a "default" value or an "equals" expression must contain a value as a part of service activation. For example, a RADIUS service VSA like "service-video(value1, value2)" that contains two or fewer mandatory variables in the dynamic service profile definition "service-video" succeeds. The service activation fails if at least one mandatory variable does not have any value associated with it, either through default or equals attribute evaluation.

Table 5 on page 34 lists supported operators and functions you can use to create expressions.



NOTE: Precedence 5 is the highest level.

Table 5: Operators and Functions

Operation	Operator	Associativity	Precedence	Action
Arithmetic Addition	+	Left	1	Adds the elements to the right and left of the operator together.
Arithmetic Subtraction	-	Left	1	Subtracts the element to the right of the operator from the element to the left of the operator.
Arithmetic Multiplication	*	Left	2	Multiplies the element to the left of the operator by the element to the right of the operator.
Arithmetic Division	/	Left	2	Divides the element to the left of the operator by the element to the right of the operator.
Arithmetic Modulo	%	Left	2	Divides the element to the left of the operator by the element to the right of the operator and returns the integer remainder. If the element to the left of the operator is less than the element to the right of the operator, the result is the element to the left of the operator.
Concatenation	##	Left	3	Creates a new string by joining the string values to the left of the operator and the values to the right of the operator together.

Table 5: Operators and Functions (*continued*)

Operation	Operator	Associativity	Precedence	Action
Maximum	max(param1,param2)	Left	4	Takes the maximum of the two values passed as parameters.
Minimum	min(param1,param2)	Left	4	Takes the minimum of the two values passed as parameters.
Round	round(param1)	-	4	Rounds the value to the nearest integer.
Truncate	trunc(param1)	-	4	Truncates a non-integer value to the value left of the decimal point.
Convert to String	toStr(param1)	-	4	Converts the variable inside the parentheses to a null terminated string.
Convert to Integer	toInt(param1)	-	4	Converts the parameter to an integer. A single string or variable is allowed as a parameter.
Random	rand()	-	4	Generates a random numerical value.
If Not Zero	ifNotZero(param1, param2)	Left	4	Returns the second parameter if the first parameter is not zero. Returns NULL if first parameter is zero.
Parentheses	()	-	5	Groups operands and operators to achieve results different from simple precedence; effectively has the highest precedence.

Expressions are evaluated after variables are populated with values. The evaluation is conducted immediately before profile instantiation and includes value checking. If the computed values are not acceptable, or rules governing expression syntax are broken, the expression evaluation fails, profile instantiation does not occur, and messages are logged to describe the errors.

[Table 6 on page 35](#) lists the possible expression error scenarios and the action taken by the router software.

Table 6: Expression Errors and Actions

Error	Occurance	Action	Variable Value
Parsing error	Commit check phase	Commit fails	not applicable
Circular variable dependency error	Commit check phase	Commit fails	not applicable
Variables inside the expressions are not defined	Commit check phase	Commit fails	not applicable
Divide by zero	Profile Instantiation	Profile instantiation fails	Zero (0)

Table 6: Expression Errors and Actions (*continued*)

Error	Occurance	Action	Variable Value
Adding string to a number	Profile Instantiation	Profile instantiation fails	Zero (0)
Overflow error	Profile Instantiation	Profile instantiation fails	Undefined
Underflow error	Profile Instantiation	Profile instantiation fails	Undefined

You can also configure the user-defined variables with a default value. The default value provides a standalone configuration for the associated statement or a backup for the statement configuration if the RADIUS server is inaccessible or the VSA attribute does not contain a value.

Related Documentation

- [Configuring Variable Expressions in Dynamic Profiles on page 54](#)
- [Dynamic Profiles Overview on page 4](#)
- [Configuring User-Defined Dynamic Variables in Dynamic Profiles on page 52](#)
- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework](#)
- [Junos OS Predefined Variables on page 8](#)

Access Profiles and Service Profiles Overview

Dynamic profiles enable you to configure parameters that enable access and services to subscribers.

Access profiles, also known as client profiles, contain the parameters to grant access and provide basic service to a subscriber during initial login. By configuring the access profile with Junos OS predefined variables, you also enable the service to be activated for those subscribers at login. The RADIUS variables in an access profile map to one or more VSAs.

Service profiles contain parameters that activate or deactivate services for a subscriber. You can apply a service profile with an access profile at login, or apply the service profile separately to modify a service. A service profile maps to a Service VSA.

Functionality Supported in Access and Service Profiles

The types of variables, expressions, and default values that you can use depends on the type of dynamic profile.

[Table 7 on page 36](#) lists the types of variables supported by access profiles and service profiles.

Table 7: Types of Variables Supported in Dynamic Profiles

Type of Dynamic Profile	Junos OS Predefined Variable (Local)	Junos OS Predefined Variable (RADIUS)	User-Defined Variable
Access Profile	Yes	Yes	Yes

Table 7: Types of Variables Supported in Dynamic Profiles (*continued*)

Type of Dynamic Profile	Junos OS Predefined Variable (Local)	Junos OS Predefined Variable (RADIUS)	User-Defined Variable
Service Profile	Yes	No	Yes

[Table 8 on page 37](#) lists the default values, expressions, and unique identifiers supported by access profiles and service profiles.

Table 8: Default Values and Expressions Supported in Dynamic Profiles

Type of Dynamic Profile	Default Values	Expressions	Unique Identifiers
Access Profile	Yes (RADIUS predefined variables only)	No	Yes (Schedulers and Scheduler maps only)
Service Profile	Yes (User-defined variables only)	Yes (Service activation only)	Yes (Firewall filters only)

Related Documentation

- [Dynamic Profiles Overview on page 4](#)
- [Variable Expressions Overview on page 33](#)
- [Unique Identifiers for Firewall Variables in Dynamic Profiles](#)

PART 2

Configuration

- [Configuration Overview on page 41](#)
- [Configuring Variables in Dynamic Profiles on page 51](#)
- [Configuring Access and Access-Internal Routes in Dynamic Profiles on page 57](#)
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- [Examples on page 69](#)
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CHAPTER 2

Configuration Overview

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Configuring a Dynamic Profile for Client Access on page 43](#)
- [Configuring a Dynamic Profile for Various Levels of Services on page 44](#)
- [Configuring Unique Identifiers for Parameterized Filters in Dynamic Profiles on page 45](#)
- [Enabling Dynamic Profiles to use Multiple Versions on page 47](#)
- [Modifying Dynamic Profiles with Versioning Disabled on page 47](#)

Configuring a Basic Dynamic Profile

This topic describes how to create a basic dynamic profile. A basic profile must contain a profile name and have both an interface variable name (such as **\$junos-interface-ifd-name**) included at the **[edit dynamic-profiles *profile-name* interfaces** hierarchy level and logical interface variable name (such as **\$junos-underlying-interface-unit** or **\$junos-interface-unit**) at the **[edit dynamic-profiles *profile-name* interfaces *variable-interface-name* unit]** hierarchy level.

Before you configure dynamic profiles for initial client access:

1. Configure the necessary router interfaces that you want DHCP clients to use when accessing the network.

See *Subscriber Interface Overview* for information about the types of interfaces you can use with dynamic profiles and how to configure them.
2. Configure all RADIUS values that you want the profiles to use when validating DHCP clients for access to the multicast network.

See *Configuring RADIUS Server Parameters for Subscriber Access*

To configure a basic dynamic profile:

1. Name the profile.

[edit]
user@host# edit dynamic-profiles basic-profile
2. Define the **interface-name** statement with the internal **\$junos-interface-ifd-name** variable used by the router to match the interface name of the receiving interface.

[edit dynamic-profiles basic-profile]

```
user@host# edit interfaces $junos-interface-ifd-name
```

3. Define the **unit** statement with the internal variable:

- When referencing an existing interface, specify the **\$junos-underlying-interface-unit** variable used by the router to match the unit value of the receiving interface.
- When creating dynamic interfaces, specify the **\$junos-interface-unit** variable used by the router to generate a unit value for the interface.

```
[edit dynamic-profiles basic-profile interfaces "$junos-interface-ifd-name"]  
user@host# set unit $junos-underlying-interface-unit
```

or

```
[edit dynamic-profiles basic-profile interfaces "$junos-interface-ifd-name"]  
user@host# set unit $junos-interface-unit
```

4. If you are using interface sets, you must apply the traffic-control profile to the interface set in the static **[edit class-of-service]** hierarchy. The interface set name must be explicitly referenced in the CoS configuration as part of the static configuration outside of the dynamic profile. The CoS configuration is static and the interface set name must be statically referenced.

This rule applies to all interface sets except ACI sets.

Related Documentation

- *CoS for Interface Sets of Subscribers Overview*
- [Configuring a Dynamic Profile for Client Access on page 43](#)
- [Configuring a Dynamic Profile for Various Levels of Services on page 44](#)
- [Configuring Predefined Dynamic Variables in Dynamic Profiles on page 51](#)
- *Configuring Static Subscriber Interfaces in Dynamic Profiles*
- *Configuring VLAN Dynamic Profiles*
- [Dynamic Profiles Overview on page 4](#)
- [Dynamic Variables Overview on page 6](#)
- [Junos OS Predefined Variables on page 8](#)
- [Example: Firewall Dynamic Profile on page 70](#)
- [Example: IGMP Dynamic Profile on page 69](#)

Configuring a Dynamic Profile for Client Access

This topic describes how to create a basic dynamic profile that enables DHCP clients to dynamically access the multicast network.

Before you configure dynamic profiles for initial client access:

1. Create a basic dynamic profile.

See [“Configuring a Basic Dynamic Profile” on page 41](#).

2. Configure the necessary router interfaces that you want accessing DHCP clients to use.

See *Subscriber Interface Overview* for information about the types of interfaces you can use with dynamic profiles and how to configure them.

3. Ensure that the router is configured to enable communication between the client and the RADIUS server.

See *Specifying the Authentication and Accounting Methods for Subscriber Access*.

4. Configure all RADIUS values that you want the profiles to use when validating DHCP clients for access to the multicast network.

See *Configuring RADIUS Server Parameters for Subscriber Access*.

To configure an initial client access dynamic profile:

1. Access an IGMP access profile.

```
user@host# edit dynamic-profiles access-profile
[edit dynamic-profiles access-profile]
user@host#
```

2. Define the IGMP interface with the interface variable.



NOTE: The variable value is replaced by the name of the interface over which the router received the DHCP message.

```
[edit dynamic-profiles access-profile]
user@host# set protocols igmp interface $junos-interface-name
```

3. (Optional) Enable or disable accounting on the IGMP interface.

```
[edit dynamic-profiles access-profile protocols igmp interface "$junos-interface-name"]
user@host# set accounting
```

or

```
[edit dynamic-profiles access-profile protocols igmp interface "$junos-interface-name"]
user@host# set no-accounting
```



NOTE: This statement enables you to override the accounting setting at the IGMP protocol level. For example, if IGMP accounting is enabled at the [edit protocols igmp interface *interface-name*] hierarchy level, you can use the no-accounting statement to disable accounting for any IGMP interfaces that are dynamically created by the dynamic profile. If IGMP accounting is not enabled at the [edit protocols igmp interface *interface-name*] hierarchy level, you can use the accounting statement to enable accounting for any IGMP interfaces that are dynamically created by the dynamic profile.

4. Set the IGMP interface to remain enabled.

```
[edit dynamic-profiles access-profile protocols igmp interface "$junos-interface-name"]
user@host# set disable:$junos-igmp-enable
```



NOTE: RADIUS is capable of disabling IGMP. By assigning the enable variable to the disable statement, you can ensure that IGMP remains enabled.

5. (Optional) Specify a group policy for the IGMP interface.

```
[edit dynamic-profiles access-profile protocols igmp interface "$junos-interface-name"]
user@host# set group-policy report-reject-policy
```

6. (Optional) Enable immediate leave on the IGMP interface.

```
[edit dynamic-profiles access-profile protocols igmp interface "$junos-interface-name"]
user@host# set immediate-leave:$junos-igmp-immediate-leave
```

7. (Optional) Set the IGMP interface to obtain the IGMP version from RADIUS.

```
[edit dynamic-profiles access-profile protocols igmp interface "$junos-interface-name"]
user@host# set version $junos-igmp-version
```

**Related
Documentation**

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Dynamic Profiles Overview on page 4](#)

Configuring a Dynamic Profile for Various Levels of Services

This topic discusses how to create dynamic profiles to define various levels of service for DHCP clients.

Before you configure dynamic profiles for client services:

1. Create a basic dynamic profile.
See [“Configuring a Basic Dynamic Profile” on page 41](#).
2. Configure a dynamic profile that enables DHCP clients access to the network.
See [“Configuring a Dynamic Profile for Client Access” on page 43](#)



NOTE: You can create a basic dynamic profile that contains both access configuration and some level of basic service.

3. Ensure that the router is configured to enable communication between the client and the RADIUS server.

See *Specifying the Authentication and Accounting Methods for Subscriber Access*.

4. Configure all RADIUS values that you want the profiles to use when validating DHCP clients.

See *Configuring RADIUS Server Parameters for Subscriber Access*

To configure an initial client access dynamic profile:

1. Access the desired service profile.

```
user@host# set dynamic-profiles basic-service-profile
```

2. (Optional) Define any IGMP protocols values as described for creating a basic access profile to combine a basic service with access in a profile.

See “[Configuring a Dynamic Profile for Client Access](#)” on page 43.

3. (Optional) Specify any filters for the interface.

See *Dynamically Attaching Statically Created Filters for Any Interface Type*, *Dynamically Attaching Statically Created Filters for a Specific Interface Family Type*, or *Dynamically Attaching Filters Using RADIUS Variables*.

4. Define any CoS values for the service level you want this profile to configure on the interface.

Related Documentation

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Dynamic Profiles Overview on page 4](#)

Configuring Unique Identifiers for Parameterized Filters in Dynamic Profiles

This topic discusses how to configure unique identifiers (UID) for parameterized filters in a dynamic profile. The dynamic profile obtains and replaces data for these variables from an incoming client data packet. You can specify these variables in the body of a dynamic profile without having to first define the variables at the **[edit dynamic-profiles profile-name variables]** hierarchy level.

Before you configure dynamic variables:

1. Create a basic dynamic profile.

See “[Configuring a Basic Dynamic Profile](#)” on page 41.

2. Ensure that the router hardware is configured in the network to accept subscriber access.

To configure unique identifiers for parameterized filters in a dynamic profile:

1. Access the desired dynamic profile.

```
[edit]
user@host# edit dynamic-profiles Profile1
[edit dynamic-profiles Profile1]
```

2. Configure the necessary variables.

```
[edit dynamic-profiles service-profile]
user@host# set variable policer1 uid

[edit dynamic-profiles service-profile]
user@host# set variables in-filter uid-reference
```

Example of a dynamic-profile for parameterized filters:

```
dynamic profile {
  service-profile {
    variable {
      in-filter {
        default-value filter1;
        mandatory;
        uid-reference;
      }
      policer1 {
        uid;
      }
      filter1 {
        uid;
      }
      policer2 {
        uid;
      }
      filter2 {
        uid;
      }
    }
  }
}
```

Related Documentation

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Configuring User-Defined Dynamic Variables in Dynamic Profiles on page 52](#)
- [Dynamic Profiles Overview on page 4](#)
- [Dynamic Variables Overview on page 6](#)
- [Junos OS Predefined Variables on page 8](#)
- [Example: Firewall Dynamic Profile on page 70](#)
- [Example: IGMP Dynamic Profile on page 69](#)

Enabling Dynamic Profiles to use Multiple Versions

You can create new versions of dynamic profiles that are currently in use by subscribers. Any subscriber that logs in following a dynamic profile modification uses the latest version of the dynamic profile. Subscribers that are already active continue to use the older version of the dynamic profile until they log out or their session terminates.



NOTE: You must enable or disable dynamic profile version creation before creating or using any dynamic profiles on the router. Enabling or disabling dynamic profile version creation after dynamic profiles are configured is not supported.

To configure versioning for dynamic profiles:

1. Access the router system hierarchy level.

```
[edit]
user@host# edit system
```

2. Access the global dynamic profile options.

```
[edit system]
user@host# edit dynamic-profile-options
```

3. Enable version creation for dynamic profiles on the router.

```
[edit system dynamic-profile-options]
user@host# set versioning
```

Related Documentation

- For special considerations when configuring dynamic profile version creation, see [Dynamic Profiles Overview on page 4](#).
- [Configuring a Basic Dynamic Profile on page 41](#)

Modifying Dynamic Profiles with Versioning Disabled

You use dynamic profiles to configure large groups of subscribers. However, after you have configured and applied dynamic profiles, be cautious when modifying any dynamic profiles that are in use by active subscribers on the router if you have not enabled the router to use dynamic profile versioning. This section provides guidelines and procedures for modifying existing profiles and applying them to subscriber interfaces if dynamic profile versioning is not enabled on the router.

When modifying dynamic profiles, keep the following considerations in mind:

- Do not modify a dynamic profile when dynamic profile versioning is disabled and the dynamic profile is in use by active subscribers.
- Modifying a dynamic profile when dynamic profile versioning is disabled and when the dynamic profile is in use by active subscribers can lead to unpredictable behavior.

When a dynamic profile is modified and committed when dynamic profile versioning is not enabled, the router:

1. Logs a warning that the profiles are being modified and committed.
2. Determines whether the profile is currently being use by any subscriber.
3. If the profile is in use by a subscriber, the commit fails and the router logs errors to report the conflict.

Juniper Networks recommends that you only modify dynamic profiles when you have enabled dynamic profile versioning on the router. However, to properly modify a dynamic profile when dynamic profile versioning is disabled on the router:

1. Ensure that no subscribers are using the dynamic profile.
2. Create a new dynamic profile with a different name that contains the desired changes:

Original Profile

```
profile1 {
  interfaces {
    "$junos-interface-ifd-name" {
      unit "$junos-underlying-interface-unit" {
        family inet {
          filter {
            input "$junos-input-filter";
          }
        }
      }
    }
  }
}
```

Original DHCP Configuration

```
forwarding-options {
  dhcp-relay {
    traceoptions {
      flag all;
    }
    .....
    dynamic-profile profile1;
    .....
  }
}
```

New Profile

```
profile2 {
  interfaces {
    "$junos-interface-ifd-name" {
      unit "$junos-underlying-interface-unit" {
        family inet {
          filter {
            input "$junos-input-filter";
            output "$junos-output-filter; /* added output filter variable */
          }
        }
      }
    }
  }
}
```

```

    }
  }
}

```

Modified DHCP Configuration

```

forwarding-options {
  dhcp-relay {
    traceoptions {
      flag all;
    }
    .....
    dynamic-profile profile2; /* Name changed from profile1 */
    .....
  }
}

```

3. Commit the configuration containing the modified profile.

The modified profile is used for any new subscribers that access the router.

Related Documentation

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Dynamic Profiles Overview on page 4](#)
- [Enabling Dynamic Profiles to use Multiple Versions on page 47](#)

CHAPTER 3

Configuring Variables in Dynamic Profiles

- [Configuring Predefined Dynamic Variables in Dynamic Profiles on page 51](#)
- [Configuring Default Values for Predefined Variables in a Dynamic Profile on page 52](#)
- [Configuring User-Defined Dynamic Variables in Dynamic Profiles on page 52](#)
- [Configuring Variable Expressions in Dynamic Profiles on page 54](#)

Configuring Predefined Dynamic Variables in Dynamic Profiles

This topic discusses how to configure predefined variables in a dynamic profile. The dynamic profile obtains and replaces data for these variables from an incoming client data packet. You can specify these variables in the body of a dynamic profile without having to first define the variables at the **[edit dynamic-profiles *profile-name* variables]** hierarchy level.

Before you configure dynamic variables:

1. Create a basic dynamic profile.
[See “Configuring a Basic Dynamic Profile” on page 41.](#)
2. Ensure that the router hardware is configured in the network to accept subscriber access.

To configure predefined variables in a dynamic profile:

1. Access the desired dynamic profile.

```
[edit]
user@host# edit dynamic-profiles igmpProfile1
[edit dynamic-profiles igmpProfile1]
```
2. Configure the necessary variables.

```
[edit dynamic-profiles igmpProfile1]
user@host# set protocols igmp interface $junos-interface-name
```

For a complete list of supported predefined variables, see [“Junos OS Predefined Variables” on page 8.](#)

Related Documentation

- [Configuring a Basic Dynamic Profile on page 41](#)
- [Configuring User-Defined Dynamic Variables in Dynamic Profiles on page 52](#)

- [Dynamic Profiles Overview on page 4](#)
- [Dynamic Variables Overview on page 6](#)
- [Junos OS Predefined Variables on page 8](#)
- [Example: Firewall Dynamic Profile on page 70](#)
- [Example: IGMP Dynamic Profile on page 69](#)

Configuring Default Values for Predefined Variables in a Dynamic Profile

You can configure default values for the predefined variables that are configured in a dynamic profile. These default values are used when RADIUS does not supply a value.

To configure default values for Junos predefined variables:

1. Specify that you want to configure the dynamic profile.

```
[edit]
user@host# edit dynamic-profile profile-name
```

2. Configure the default value for a specific option within a predefined variable.

```
[edit dynamic-profiles profile-name]
user@host# set predefined-variable-defaults predefined-variable variable-option
default-value
```



NOTE: Do not use the “junos-” prefix when specifying the *predefined-variable*.

Related Documentation

- For a list of predefined variables and options for which you can configure default values, see [Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs on page 26](#)
- [Junos OS Predefined Variables on page 8](#)
- [Dynamic Variables Overview on page 6](#)

Configuring User-Defined Dynamic Variables in Dynamic Profiles

This topic discusses how to configure the user-defined dynamic variables in a dynamic profile. You define user-defined variables for individual dynamic profiles at the **[edit dynamic-profiles *profile-name* variables]** hierarchy level. At this hierarchy level, you create an association between a variable call value (for example, **\$junos-igmp-version**) that appears in the body of the dynamic profile and data associated with that call value that is managed in an externally configured server (for example, a RADIUS VSA managed on a RADIUS server) or defined as a default value in the **variables** stanza.

Before you configure dynamic variables:

1. Create a basic dynamic profile.

See [“Configuring a Basic Dynamic Profile” on page 41](#).

2. Ensure that the router is configured to enable communication between the client and the RADIUS server.

See *Specifying the Authentication and Accounting Methods for Subscriber Access*.

3. Configure all RADIUS values that you want the profiles to use when validating subscribers.

See *Configuring RADIUS Server Parameters for Subscriber Access*

To configure variables in a dynamic profile:

1. Access the **variables** stanza in the desired dynamic profile.

```
user@host# edit dynamic-profiles profile1 variables
[edit dynamic-profiles profile1 variables]
```

2. Specify a name to identify the variable.

The variable name can be any alphanumeric value. The name is an association to a variable in the dynamic profile configuration. For example, if you specify a variable name of “**igmp-version**” as the variable name, you must specify the call variable “**\$igmp-version**” in the dynamic profile configuration for the statement you want the variable to define.

```
[edit dynamic-profiles igmpProfile1 variables]
user@host# set igmp-version
```

3. Configure the variable using one (or both) of the following methods:

- Specify a RADIUS attribute and RADIUS tag (when required) for the variable.

```
[edit dynamic-profiles igmpProfile1 variables]
user@host# set igmp-version radius vendor-id 4874 attribute 78
```

- Configure a default value for the variable.

```
[edit dynamic-profiles igmpProfile1 variables]
user@host# set igmp-version default-value 3
```



NOTE: You can configure variables by using the RADIUS method, the default value method, or both. If you choose to configure both a RADIUS attribute and a default value for the variable, the RADIUS attribute takes precedence over the default value. However, the dynamic profile applies the default value if the router cannot contact the RADIUS server or if the RADIUS server does not contain a value for the assigned attribute.

4. Configure the call variable in the dynamic profile.

```
[edit dynamic-profiles igmpProfile1]
user@host# set protocols igmp interface demux0 version $igmp-version
```



NOTE: The call variable must match the name of the variable that you configured in the variables stanza.

Related Documentation

- [Dynamic Profiles Overview on page 4](#)
- [Dynamic Variables Overview on page 6](#)
- [Configuring a Basic Dynamic Profile on page 41](#)
- [User-Defined Variables on page 32](#)
- [Configuring Predefined Dynamic Variables in Dynamic Profiles on page 51](#)
- [Example: Configuring Dynamic Hierarchical Scheduling and Queuing for Subscriber Access](#)
- [Example: Firewall Dynamic Profile on page 70](#)
- [Example: IGMP Dynamic Profile on page 69](#)

Configuring Variable Expressions in Dynamic Profiles

You can create expressions—groups of arithmetic operators, string operators, and operands—for use as variables within dynamic profiles. These expressions are used as variable values to configure dynamic subscriber interfaces.

To configure dynamic profile variable expressions:

1. Access the dynamic profile for which you want to create variable expressions.

```
[edit]
user@host# edit dynamic-profiles profile-name
```

2. Access the **variables** hierarchy for the dynamic profile.

```
[edit dynamic-profiles profile-name]
user@host# edit variables
```

3. Define the variable using the expression operators and operands described in “[Variable Expressions Overview](#)” on page 33.

```
[edit dynamic-profiles profile-name variables]
user@host# set expression
```

[Table 9 on page 54](#) provides several examples of expressions that you can create using the supported operators and functions.

Table 9: Expression Examples

Example	Description
video-filter equals “ ‘ Filter1’ ”	Assigns the string “ Filter1” to the dynamic \$video-filter variable.
video-filter2 equals “\$video-filter ## ‘ Filter2’ ”	Converts dynamic variable “\$video-filter” to a string and concatenates the new string with the string “ Filter2”. The result is the string “\$video-filter Filter2” assigned to the \$video-filter2 variable.

Table 9: Expression Examples (*continued*)

Example	Description
tempvar equals "120"	Converts "120" to an integer and assigns the integer to the \$tempvar variable.
transmit-rate2 equals " (\$transmit-rate1 * 2)/3 + \$tempvar)"	Multiplies the "transmit-rate1" variable by 2 and divides that value by the sum of 3 and the value of "\$tempvar". The result is assigned to the \$transmit-rate2 variable.
host-ip equals " '10.0.0.2' "	Assigns the string "10.0.02" to the \$host-ip variable.
max-val "max(\$max1,\$max2)"	Assigns the greater of value "max1" or "max2" to the \$max-val variable.
min-val "\$min(\$var1,30)"	Assign the smaller of value "var1" and "30" to the \$min-val variable.
rounded-var equals "round(\$var1)"	Rounds off the value of the variable "\$var1" to the nearest integer and assigns the value to the \$rounded-var variable.
trunc-var equals "trunc(1234.5)"	Truncates the value in parentheses to the left side of the decimal and assigns the resulting value to the \$trunc-var variable.
bwg-shaping-rate equals "\$anbp-downstream - (\$anbp-downstream % 2 * (1 - \$sp-qos-cell-mode))"	Evaluates the expression as per the precedence set in the parentheses.
temp-filter1 equals " 'Filter1' ## toStr(\$filter)"	Converts the "\$filter" variable to a string value and concatenates the converted string to the string "Filter1". The resulting combined string is assigned to the \$temp-filter1 variable.

**Related
Documentation**

- [Variable Expressions Overview on page 33](#)
- [Dynamic Profiles Overview on page 4](#)
- [Configuring User-Defined Dynamic Variables in Dynamic Profiles on page 52](#)
- [Junos OS Predefined Variables on page 8](#)

CHAPTER 4

Configuring Access and Access-Internal Routes in Dynamic Profiles

- [Access and Access-Internal Routes for Subscriber Management on page 57](#)
- [Overview of Access Routes and Access-Internal Routes Removal After Graceful Routing Engine Switchover on page 58](#)
- [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
- [Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62](#)
- [Configuring Dynamic Access-Internal Routes for PPP Subscriber Management on page 62](#)
- [Delaying Removal of Access Routes and Access-Internal Routes After Graceful Routing Engine Switchover on page 63](#)
- [Verifying the Configuration of Access and Access-Internal Routes for Subscriber Management on page 64](#)

Access and Access-Internal Routes for Subscriber Management

The DHCP and PPP applications on the router use both access routes and access-internal routes to represent either the end users or the networks behind the attached router. An access route represents a network behind an attached router, and is set to a preference of 13. An access-internal route is a /32 route that represents a directly attached end user, and is set to a preference of 12.

Access routes typically are used to apply the values of the RADIUS Framed-Route attribute [22] for IPv4 routes and the Framed-IPv6-Route attribute [99] for IPv6 routes. A framed route consists of a prefix that represents a public network behind the CPE, a next-hop gateway, and optional route attributes consisting of a combination of metric, preference, and tag. The only mandatory component of the framed route is the prefix. The next-hop gateway can be specified explicitly in the framed route. Alternatively, the absence of the gateway address implies address 0.0.0.0, which the must resolve using the CPE's IP address. In either case, the convention is that the next-hop gateway is the CPE IP address.

You can configure a dynamic profile to use predefined variables to dynamically configure access routes using the values specified in the RADIUS attribute. To configure access routes include the **access** stanza at the **[edit dynamic-profiles *profile-name* routing-options]**

hierarchy level. To configure access-internal routes, include the **access-internal** stanza at the same hierarchy level.

Consider the following rules for resolving the next-hop gateway to determine when each stanza is required:

- If the RADIUS framed route always specifies the next-hop gateway, only the **access** stanza is required in the dynamic profile. The **access-internal** stanza is not required.
- If the RADIUS framed route does not specify the next-hop gateway—as is more common—the variable representing the next-hop, `$junos-framed-route-nexthop`, defaults to 0.0.0.0. This value implies that the CPE IP address is to be used. For this case, the **access-internal** stanza is required to resolve `$junos-framed-route-nexthop` to the CPE IP address (represented in the **access-internal** stanza by `$junos-subscriber-ip-address`) and the logical interface (represented as a qualified next-hop by `$junos-interface-name`).



BEST PRACTICE: We recommend that you always include the **access-internal** stanza in the dynamic-profile when the **access** stanza is present for framed route support.

Related Documentation

- [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
- [Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62](#)
- [Configuring Dynamic Access-Internal Routes for PPP Subscriber Management on page 62](#)
- *RADIUS IETF Attributes Supported by the AAA Service Framework*

Overview of Access Routes and Access-Internal Routes Removal After Graceful Routing Engine Switchover

For a subscriber network configured with either nonstop active routing (NSR) or graceful restart, you can configure the router to wait 180 seconds (3 minutes) before removing access routes and access-internal routes for DHCP and PPP subscriber management after a graceful Routing Engine switchover (GRES) takes place.

- [Benefits of Delaying Removal of Access Routes and Access-Internal Routes on page 58](#)
- [Graceful Restart and Delayed Removal of Access Routes and Access-Internal Routes on page 59](#)
- [Nonstop Active Routing and Delayed Removal of Access Routes and Access-Internal Routes on page 59](#)

Benefits of Delaying Removal of Access Routes and Access-Internal Routes

The 3-minute delay in removing access routes and access-internal routes after a graceful Routing Engine switchover provides sufficient time for the DHCP client process (`jdhcpd`),

PPP client process (jpppd), or routing protocol process (rpd) to reinstall the access routes and access-internal routes before the router removes the stale routes from the forwarding table. As a result, the risk of traffic loss is minimized because the router always has available subscriber routes for DHCP subscribers and PPP subscribers.

Configuring the router to delay removal of access routes and access-internal routes after a graceful Routing Engine switchover has the following benefits:

- Provides sufficient time to reinstall subscriber routes from the previously active Routing Engine
- Prevents loss of subscriber traffic due to unavailable routes

Graceful Restart and Delayed Removal of Access Routes and Access-Internal Routes

In subscriber networks with graceful restart and routing protocols such as BGP and OSPF configured, the router purges any remaining stale access routes and access-internal routes as soon as the graceful restart operation completes, which can occur very soon after completion of the graceful Routing Engine switchover.

Configuring the delay in removing access and access-internal routes after a graceful Routing Engine switchover causes the router to retain the stale routes for a full 180 seconds, which provides sufficient time for the jdhcpd or jpppd client process to reinstall all of the subscriber routes.

Nonstop Active Routing and Delayed Removal of Access Routes and Access-Internal Routes

In subscriber networks with nonstop active routing and routing protocols such as BGP and OSPF configured, the routing protocol process (rpd) immediately purges the stale access routes and access-internal routes that correspond to subscriber routes. This removal results in a loss of subscriber traffic.

Configuring the delay in removing access and access-internal routes after a graceful Routing Engine switchover causes the router to retain the stale routes for a full 180 seconds, which prevents potential traffic loss due to unavailable routes.

Related Documentation

- [Delaying Removal of Access Routes and Access-Internal Routes After Graceful Routing Engine Switchover on page 63](#)
- [Access and Access-Internal Routes for Subscriber Management on page 57](#)
- [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
- For information about configuring static routes, see the *Junos OS Routing Protocols Library for Routing Devices*

Configuring Dynamic Access Routes for Subscriber Management

You can dynamically configure access routes for DHCP and PPP subscribers based on the values specified in the following RADIUS attributes:

- For IPv4 access routes, use the variable, **\$junos-framed-route-ip-address-prefix**. The route prefix variable is dynamically replaced with the value in Framed-Route RADIUS attribute [22].
- For IPv6 access routes, use the variable, **\$junos-framed-route-ipv6-address-prefix**. The variable is dynamically replaced with the value in Framed-IPv6-Route RADIUS attribute [99].

To dynamically configure access routes:

1. Configure the route prefix for the access route as a variable.

For IPv4:

```
[edit dynamic-profiles profile-name routing-options]
user@host# edit access route $junos-framed-route-ip-address-prefix
```

For IPv6:

```
[edit dynamic-profiles profile-name routing-options]
user@host# edit access route $junos-framed-route-ipv6-address-prefix
```

2. Configure the next-hop address as a variable.

For IPv4:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ip-address-prefix"]
user@host# set next-hop $junos-framed-route-nexthop
```

For IPv6:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ipv6-address-prefix"]
user@host# set next-hop $junos-framed-route-ipv6-nexthop
```

3. Configure the metric as a variable.

For IPv4:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ip-address-prefix"]
user@host# set metric $junos-framed-route-cost
```

For IPv6:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ip-address-prefix"]
user@host# set metric $junos-framed-route-ipv6-cost
```

4. Configure the preference as a variable (IPv4 only).

For IPv4:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ip-address-prefix"]
user@host# set preference $junos-framed-route-distance
```

For IPv6:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ip-address-prefix"]
user@host# set preference $junos-framed-route-ipv6-distance
```

5. Configure the tag as a variable (IPv4 only).

IPv4:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ip-address-prefix"]
user@host# set tag $junos-framed-route-tag
```

IPv6:

```
[edit dynamic-profiles profile-name routing-options access route
"$junos-framed-route-ip-address-prefix"]
user@host# set tag $junos-framed-route-ipv6-tag
```



BEST PRACTICE: We recommend that you always include the `access-internal` stanza in the dynamic-profile when the `access` stanza is present for framed route support.

Related Documentation

- [Access and Access-Internal Routes for Subscriber Management on page 57](#)
- [Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62](#)
- [Configuring Dynamic Access-Internal Routes for PPP Subscriber Management on page 62](#)
- [Verifying the Configuration of Access and Access-Internal Routes for Subscriber Management on page 64](#)
- [RADIUS IETF Attributes Supported by the AAA Service Framework](#)

Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management

You can dynamically configure access-internal routes. Configuring support for access-internal variables is optional, but it ensures that values from the access-internal variables are used if the next-hop value is missing in the relevant RADIUS attribute—Framed-Route [22] for IPv4 and Framed-IPv6-Route [99] for IPv6.



BEST PRACTICE: We recommend that you always include the `access-internal` stanza in the dynamic-profile when the `access` stanza is present for framed route support.

DHCP subscriber interfaces require the qualified-next-hop to identify the interface and the MAC address.

To dynamically configure access-internal routes:

1. Specify that you want to configure the access-internal route.

```
user@host# edit dynamic-profiles profile-name routing-options
```

2. Configure the IP address and the qualified next-hop address as variables.

```
[edit dynamic-profiles profile-name routing-options]  
user@host# edit access-internal route $junos-subscriber-ip-address qualified-next-hop  
$junos-interface-name
```



NOTE: Prior to Junos OS Release 10.0, the variable used for `qualified-next-hop` was `$junos-underlying-interface`. It is now `$junos-interface-name`.

3. Configure the MAC address for the qualified next-hop as a variable.

```
[edit dynamic-profiles profile-name routing-options access-internal route  
$junos-subscriber-ip-address qualified-next-hop $junos-underlying-interface]  
user@host# set mac-address $junos-subscriber-mac-address
```

Related Documentation

- [Access and Access-Internal Routes for Subscriber Management on page 57](#)
- [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
- [Verifying the Configuration of Access and Access-Internal Routes for Subscriber Management on page 64](#)

Configuring Dynamic Access-Internal Routes for PPP Subscriber Management

You can dynamically configure access-internal routes for PPP subscribers. Configuring support for access-internal variables is optional, but it ensures that values from the access-internal variables are used if the next-hop value is missing in the relevant RADIUS attribute—Framed-Route [22] for IPv4 and Framed-IPv6-Route [99] for IPv6.



BEST PRACTICE: We recommend that you always include the `access-internal` stanza in the dynamic-profile when the `access` stanza is present for framed route support.

For PPP subscriber interfaces, you do not need to specify the MAC address for access-internal routes.

To dynamically configure access-internal routes for PPP:

1. Specify that you want to configure the access-internal route.

```
user@host# edit dynamic-profiles profile-name routing-options
```

2. Specify the IP address as a variable.

```
[edit dynamic-profiles profile-name routing-options]
user@host# edit access-internal route $junos-subscriber-ip-address
```

3. Specify the qualified-next-hop as a variable.

```
[edit dynamic-profiles profile-name routing-options access-internal route
$junos-subscriber-ip-address]
user@host# set qualified-next-hop $junos-interface-name
```

Related Documentation

- [Access and Access-Internal Routes for Subscriber Management on page 57](#)
- [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
- [Verifying the Configuration of Access and Access-Internal Routes for Subscriber Management on page 64](#)

Delaying Removal of Access Routes and Access-Internal Routes After Graceful Routing Engine Switchover

In subscriber networks configured with either nonstop active routing (NSR) or graceful restart, you can configure the router to delay for 180 seconds (3 minutes) before removing access routes and access-internal routes for DHCP and PPP subscriber management after a graceful Routing Engine switchover takes place.

To configure the router to delay removal (flushing) of access-routes and access-internal routes after a graceful Routing Engine switchover:

1. Specify that you want to configure subscriber management.

```
[edit system services]
user@host# edit subscriber-management
```

2. Configure the router to wait 180 seconds before removing access-routes and access-internal routes after a graceful Routing Engine switchover.

```
[edit system services subscriber-management]
user@host# set gres-route-flush-delay
```

- Related Documentation**
- [Overview of Access Routes and Access-Internal Routes Removal After Graceful Routing Engine Switchover on page 58](#)
 - [Access and Access-Internal Routes for Subscriber Management on page 57](#)
 - [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
 - For information about configuring static routes, see the *Junos OS Routing Protocols Library for Routing Devices*

Verifying the Configuration of Access and Access-Internal Routes for Subscriber Management

- Purpose** View configuration information for access routes and access-internal routes on DHCP and PPP subscribers.
- Action**
- To display extensive information about access routes and access-internal routes:
`user@host>show route extensive`
 - To display the configuration for access routes:
`user@host>show route protocol access`
 - To display the configuration for access-internal routes:
`user@host> show route protocol access-internal`
- Related Documentation**
- [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
 - [Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62](#)
 - [Configuring Dynamic Access-Internal Routes for PPP Subscriber Management on page 62](#)

Modifying Dynamic Profiles

- [Modifying Dynamic Profiles with Versioning Disabled on page 65](#)

Modifying Dynamic Profiles with Versioning Disabled

You use dynamic profiles to configure large groups of subscribers. However, after you have configured and applied dynamic profiles, be cautious when modifying any dynamic profiles that are in use by active subscribers on the router if you have not enabled the router to use dynamic profile versioning. This section provides guidelines and procedures for modifying existing profiles and applying them to subscriber interfaces if dynamic profile versioning is not enabled on the router.

When modifying dynamic profiles, keep the following considerations in mind:

- Do not modify a dynamic profile when dynamic profile versioning is disabled and the dynamic profile is in use by active subscribers.
- Modifying a dynamic profile when dynamic profile versioning is disabled and when the dynamic profile is in use by active subscribers can lead to unpredictable behavior.

When a dynamic profile is modified and committed when dynamic profile versioning is not enabled, the router:

1. Logs a warning that the profiles are being modified and committed.
2. Determines whether the profile is currently being use by any subscriber.
3. If the profile is in use by a subscriber, the commit fails and the router logs errors to report the conflict.

Juniper Networks recommends that you only modify dynamic profiles when you have enabled dynamic profile versioning on the router. However, to properly modify a dynamic profile when dynamic profile versioning is disabled on the router:

1. Ensure that no subscribers are using the dynamic profile.
2. Create a new dynamic profile with a different name that contains the desired changes:

Original Profile

```
profile1 {  
  interfaces {  
    "$junos-interface-ifd-name" {
```

```
        unit "$junos-underlying-interface-unit" {
            family inet {
                filter {
                    input "$junos-input-filter";
                }
            }
        }
    }
}
```

Original DHCP Configuration

```
forwarding-options {
    dhcp-relay {
        traceoptions {
            flag all;
        }
        .....
        dynamic-profile profile1;
        .....
    }
}
```

New Profile

```
profile2 {
    interfaces {
        "$junos-interface-ifd-name" {
            unit "$junos-underlying-interface-unit" {
                family inet {
                    filter {
                        input "$junos-input-filter";
                        output "$junos-output-filter; /* added output filter variable */";
                    }
                }
            }
        }
    }
}
```

Modified DHCP Configuration

```
forwarding-options {
    dhcp-relay {
        traceoptions {
            flag all;
        }
        .....
        dynamic-profile profile2; /* Name changed from profile1 */
        .....
    }
}
```

3. Commit the configuration containing the modified profile.

The modified profile is used for any new subscribers that access the router.

- Related Documentation**
- [Configuring a Basic Dynamic Profile on page 41](#)
 - [Dynamic Profiles Overview on page 4](#)
 - [Enabling Dynamic Profiles to use Multiple Versions on page 47](#)

CHAPTER 6

Examples

- [Example: IGMP Dynamic Profile on page 69](#)
- [Example: Firewall Dynamic Profile on page 70](#)
- [Example: Configuring a Tiered Service Profile for Subscriber Access on page 71](#)

Example: IGMP Dynamic Profile

In this example, IGMP is configured for subscriber access using Junos OS predefined variables.

The predefined variables equate to RADIUS settings as follows:

Junos OS Predefined Variable	RADIUS VSA Name	RADIUS Attribute Number
<code>\$var-igmp-version</code>	IGMP-Version	26–78
<code>\$var-igmp-access-grp</code>	IGMP-Access-Name	26–71
<code>\$var-igmp-access-src-grp</code>	IGMP-Access-Src-Name	26–72

```
[edit dynamic-profiles profile-name]  
interfaces {  
  demux0 {  
    unit "$junos-interface-unit" {  
      demux-options {  
        underlying-interface "$junos-underlying-interface";  
      }  
      family inet {  
        demux-source {  
          "$junos-subscriber-ip-address";  
        }  
        unnumbered-address lo0.0 preferred-source-address 20.21.0.1;  
      }  
    }  
  }  
}  
protocols {  
  igmp {  
    interface "$junos-interface-name" {  
      version "$var-igmp-version";  
    }  
  }  
}
```

```

    group-policy [ "$var-igmp-access-grp" "$var-igmp-access-src-grp" ];
  }
}

```



NOTE: You must also configure any global IGMP parameters.

**Related
Documentation**

- [Configuring a Dynamic Profile for Client Access on page 43](#)

Example: Firewall Dynamic Profile

In this example, dynamic firewall is configured for subscriber access using Junos IPv4 predefined variables.

The predefined variables equate to RADIUS settings as follows:

Junos OS Predefined Variable	RADIUS VSA Name	RADIUS Attribute Number
\$junos-input-filter	Ingress-Policy-Name	26-10
\$junos-output-filter	Egress-Policy-Name	26-11

```

dynamic-profiles {
  DynamicFilterProfile {
    interfaces {
      "$junos-interface-ifd-name" {
        unit "$junos-underlying-interface-unit" {
          family inet {
            filter {
              input "$junos-input-filter";
              output "$junos-output-filter";
            }
          }
        }
      }
    }
  }
}

```



NOTE: You must also configure any global firewall parameters.

**Related
Documentation**

- [Dynamic Firewall Filters Overview](#)
- [Configuring Dynamic Firewall Filter Services for Use in Dynamic Profiles](#)

Example: Configuring a Tiered Service Profile for Subscriber Access

This example shows how to configure a tiered service profile for subscribers.

The profile contains three services:

- Gold—Subscribers that pay for this service are allocated 10M bandwidth for data, voice, and video services.
- Silver—Subscribers that pay for this service are allocated 5M bandwidth for data, voice, and video services.
- Bronze—Subscribers that pay for this service are allocated 1M bandwidth for the data service only.

Each subscriber is allocated a VLAN that is created statically. Subscribers log in using DHCP and authenticate using RADIUS. The subscribers can migrate from one service to another when they change subscriptions.

To configure a profile for a tiered service:

1. Configure the VLAN interfaces associated with each subscriber. Enable hierarchical scheduling for the interface.

```

interfaces {
  ge-2/0/0 {
    description subscribers;
    hierarchical-scheduler;
    stacked-vlan-tagging;
    unit 1 {
      vlan-tags outer 100 inner 100;
      family inet {
        unnumbered-address lo0.0 preferred-source-address 100.0.0.1;
      }
    }
    unit 2 {
      family inet {
        vlan-tags outer 101 inner 101;
        unnumbered-address lo0.0 preferred-source-address 100.0.0.1;
      }
    }
    unit 3 {
      vlan-tags outer 102 inner 102;
      family inet {
        unnumbered-address lo0.0 preferred-source-address 100.0.0.1;
      }
    }
  }
}

```

2. Configure the static CoS parameters.

In this example, each offering (video, voice, and data) is assigned a queue, and each service (Gold, Silver, and Bronze) is assigned a scheduler.

```
class-of-service {
  forwarding-classes {
    queue 0 data;
    queue 1 voice;
    queue 2 video;
  }
  scheduler-maps {
    bronze_service_smap {
      forwarding-class data scheduler data_sch;
    }
    silver_service_smap {
      forwarding-class data scheduler data_sch;
      forwarding-class voice scheduler silver_voice_sch;
      forwarding-class video scheduler silver_video_sch;
    }
    gold_service_smap {
      forwarding-class data scheduler data_sch;
      forwarding-class voice scheduler gold_voice_sch;
      forwarding-class video scheduler gold_video_sch;
    }
  }
  schedulers {
    data_sch {
      transmit-rate percent 20;
      buffer-size remainder;
      priority low;
    }
    silver_voice_sch {
      transmit-rate percent 30;
      buffer-size remainder;
      priority high;
    }
    silver_video_sch {
      transmit-rate percent 30;
      buffer-size remainder;
      priority medium;
    }
    gold_voice_sch {
      transmit-rate percent 40;
      buffer-size remainder;
      priority high;
    }
    gold_video_sch {
      transmit-rate percent 40;
      buffer-size remainder;
      priority medium;
    }
  }
}
```

3. Configure the dynamic profile for the service.

The scheduler maps configured for each service are referenced in the dynamic profile.

```
dynamic-profiles {
  subscriber_profile {
    interfaces {
```

```

"$junos-interface-ifd-name" {
    unit "$junos-underlying-interface-unit" {
        family inet;
    }
}
}
class-of-service {
    traffic-control-profiles {
        subscriber_tcp {
            scheduler-map $smap;
            shaping-rate $shaping-rate;
            guaranteed-rate $guaranteed-rate;
            delay-buffer-rate $delay-buffer-rate;
        }
    }
    interfaces {
        "$junos-interface-ifd-name" {
            unit "$junos-underlying-interface-unit" {
                output-traffic-control-profile subscriber_tcp;
            }
        }
    }
}
}

```

4. Configure access for the subscribers.

The DHCP relay agent forwards DHCP request and reply packets between a DHCP client and a DHCP server. You use DHCP relay to obtain configuration parameters, including an IP address, for subscribers. In this example, one DHCP server, address 100.20.42.1, can be used by subscribers.

The DHCP relay configuration is attached to an active server group named `service_provider_group`.

The subscribers are grouped together within the `subscriber_group`, and identifies characteristics such as authentication, username info, and the associated interfaces for the group members. In this example, it also identifies the active server group and the dynamic interface that is used by the subscribers in the group.

```

forwarding-options {
    dhcp-relay {
        server-group {
            service_provider_group {
                100.20.42.1;
            }
        }
        group subscriber_group {
            active-server-group service_provider_group;
            dynamic-profile subscriber_profile;
            interface ge-2/0/0.1;
            interface ge-2/0/0.2;
            interface ge-2/0/0.3;
        }
    }
}

```

- Related Documentation**
- For more information about configuring CoS for subscriber access, see *CoS for Subscriber Access Overview*

CHAPTER 7

Configuration Statements

- [\[edit dynamic-profiles\] Hierarchy Level on page 75](#)

[\[edit dynamic-profiles\] Hierarchy Level](#)

```
dynamic-profiles {
  profile-name {
    class-of-service {
      interfaces {
        interface-name {
          unit logical-unit-number {
            classifiers {
              type (classifier-name | default);
            }
            output-traffic-control-profile (profile-name | $junos-cos-traffic-control-profile);
            rewrite-rules {
              dscp (rewrite-name | default);
              dscp-ipv6 (rewrite-name | default);
              ieee-802.1 (rewrite-name | default) vlan-tag (outer | outer-and-inner);
              inet-precedence (rewrite-name | default);
            }
          }
        }
      }
    }
  }
  scheduler-maps {
    map-name {
      forwarding-class class-name scheduler scheduler-name;
    }
  }
  schedulers {
    (scheduler-name) {
      buffer-size (percent percentage | remainder | temporal microseconds |
        $junos-cos-scheduler-bs);
      drop-profile-map loss-priority (any | low | medium-low | medium-high | high)
        protocol (any | non-tcp | tcp) drop-profile (profile-name | predefined-variable);
      excess-priority (low | high | $junos-cos-scheduler-excess-priority);
      excess-rate (percent percentage | percent $junos-cos-scheduler-excess-rate);
      overhead-accounting (shaping-mode) <bytes (byte-value)>;
      priority (priority-level | $junos-cos-scheduler-priority);
      shaping-rate (rate | predefined-variable);
    }
  }
}
```

```

        transmit-rate (rate | percent percentage | remainder | percent percentage
            $junos-cos-scheduler-tx) <exact | rate-limit>;
    }
}
traffic-control-profiles profile-name {
    delay-buffer-rate (percent percentage | rate);
    excess-rate (percent percentage | proportion value | percent
        $junos-cos-excess-rate);
    guaranteed-rate (percent percentage | rate);
    overhead-accounting (shaping-mode) <bytes (byte-value)>;
    scheduler-map map-name;
    shaping-rate (percent percentage | rate | predefined-variable);
}
}
firewall {
    family family {
        fast-update-filter filter-name {
            interface-specific;
            match-order [match-order];
            term term-name {
                from {
                    match-conditions;
                }
                then {
                    action;
                    action-modifiers;
                }
                only-at-create;
            }
        }
        filter filter-name {
            interface-specific;
            term term-name {
                from {
                    match-conditions;
                }
                then {
                    action;
                    action-modifiers;
                }
            }
        }
    }
}
policer policer-name {
    filter-specific;
    if-exceeding {
        (bandwidth-limit bps | bandwidth-percent percentage);
        burst-size-limit bytes;
    }
    logical-bandwidth-policer;
    logical-interface-policer;
    physical-interface-policer;
    then {
        policer-action;
    }
}
}
hierarchical-policer policer-name {
    aggregate {
        if-exceeding {
            bandwidth-limit-limit bps;

```

```

        burst-size-limit bytes;
    }
    then {
        policer-action;
    }
}
premium {
    if-exceeding {
        bandwidth-limit bps;
        burst-size-limit bytes;
    }
    then {
        policer-action;
    }
}
}
three-color-policer policer-name {
    action {
        loss-priority high then discard;
    }
    logical-interface-policer;
    single-rate {
        (color-aware | color-blind);
        committed-burst-size bytes;
        committed-information-rate bps;
        excess-burst-size bytes;
    }
    two-rate {
        (color-aware | color-blind);
        committed-burst-size bytes;
        committed-information-rate bps;
        peak-burst-size bytes;
        peak-information-rate bps;
    }
}
}
}
policy-options {
    prefix-listname {
        ip-addresses;
    }
}
}
interfaces {
    interface-name {
        unit logical-unit-number {
            family family {
                access-concentrator name;
                address address;
                duplicate-protection;
                dynamic-profile profile-name;
                filter {
                    adf {
                        counter;
                        input-precedence precedence;
                        not-mandatory;
                        output-precedence precedence;
                    }
                }
            }
        }
    }
}

```

```

        rule rule-value;
    }
    input filter-name {
        precedence precedence;
        shared-name filter-shared-name;
    }
    output filter-name {
        precedence precedence;
        shared-name filter-shared-name;
    }
}
max-sessions number;
max-sessions-vsa-ignore;
rpf-check {
    fail-filter filter-name;
    mode loose;
}
service {
    input {
        service-set service-set-name {
            service-filter filter-name;
        }
        post-service-filter filter-name;
    }
    output {
        service-set service-set-name {
            service-filter filter-name;
        }
    }
}
service-name-table table-name;
short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
    maximum-seconds>;
unnumbered-address interface-name <preferred-source-address address>;
}
ppp-options {
    chap;
    pap;
}
vlan-id number;
}
vlan-tagging;
}
interface-set interface-set-name {
    interface interface-name {
        unit logical-unit-number;
    }
}
}
demux0 {
    unit logical-unit-number {
        demux-options {
            underlying-interface interface-name
        }
        demux-source {
            source-prefix;
        }
    }
}

```

```

family family {
    access-concentrator name;
    address address;
    duplicate-protection;
    dynamic-profile profile-name;
    filter {
        input filter-name;
        output filter-name;
    }
    mac-validate (loose | strict);
    max-sessions number;
    max-sessions-vsa-ignore;
    service-name-table table-name;
    short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
        maximum-seconds>;
    unnumbered-address interface-name <preferred-source-address address>;
}
}
}
pp0 {
    unit logical-unit-number {
        keepalives interval seconds;
        no-keepalives;
        pppoe-options {
            underlying-interface interface-name;
            server;
        }
        ppp-options {
            authentication [ authentication-protocols ];
            chap {
                challenge-length minimum minimum-length maximum maximum-length;
            }
            pap;
        }
    }
    family inet {
        unnumbered-address interface-name;
        address address;
        service {
            input {
                service-set service-set-name {
                    service-filter filter-name;
                }
                post-service-filter filter-name;
            }
            output {
                service-set service-set-name {
                    service-filter filter-name;
                }
            }
        }
    }
    filter {
        input filter-name {
            precedence precedence;
        }
        output filter-name {
            precedence precedence;
        }
    }
}

```

```
    }
  }
}
}
}
protocols {
  igmp {
    interface interface-name {
      accounting;
      disable;
      group-policy;
      immediate-leave
      no-accounting;
      promiscuous-mode;
      ssm-map ssm-map-name;
      static {
        group group {
          source source;
        }
      }
      version version;
    }
  }
  mld {
    interface interface-name {
      disable;
      (accounting | no-accounting);
      group-policy;
      immediate-leave;
      oif-map;
      passive;
      ssm-map ssm-map-name;
      static {
        group mcast-group-address {
          exclude;
          group-count number;
          group-increment increment;
          source ip-address {
            source-count number;
            source-increment increment;
          }
        }
      }
      version version;
    }
  }
  router-advertisement {
    interface interface-name {
      current-hop-limit number;
      default-lifetime seconds;
      (managed-configuration | no-managed-configuration);
      max-advertisement-interval seconds;
      min-advertisement-interval seconds;
      (other-stateful-configuration | no-other-stateful-configuration);
      prefix prefix {
        (autonomous | no-autonomous);
```




```
    next-hop next-hop;
    metric route-cost;
    preference route-distance;
    tag route-tag;
  }
}
access-internal {
  route subscriber-ip-address {
    qualified-next-hop underlying-interface {
      mac-address address;
    }
  }
}
multicast {
  interface interface-name {
    no-qos-adjust;
  }
}
variables {
  variable-name {
    default-value default-value;
    equals expression;
    mandatory;
    radius {
      vendor-id id {
        attribute attribute-number;
        tag tag-number;
      }
      redirect-url
    }
    uid;
    uid-reference;
  }
}
```


**Related
Documentation**

- [Dynamic Profiles Overview on page 4](#)
- [CoS for Subscriber Access Overview](#)
- [Configuring a Basic Dynamic Profile on page 41](#)
- [Configuring Static Hierarchical Scheduling and Queuing in a Dynamic Profile for Subscriber Access](#)
- [Two-Color Policer Configuration Overview](#)
- [Three-Color Policer Configuration Overview](#)
- [Hierarchical Policer Configuration Overview](#)
- [Guidelines for Applying Traffic Policers](#)

access (Dynamic Access Routes)

Syntax	<pre>access { route <i>prefix</i> { next-hop <i>next-hop</i>; metric <i>route-cost</i>; preference <i>route-distance</i>; tag <i>route-tag</i>; } }</pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i>] hierarchy levels introduced in Junos OS Release 10.1.</p>
Description	<p>Dynamically configure access routes.</p>
	<div>  <p>BEST PRACTICE: We recommend that you always include the <code>access-internal</code> stanza in the dynamic-profile when the <code>access</code> stanza is present for framed-route support.</p> </div>
Options	<p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Access Routes for Subscriber Management on page 60

access-internal (Dynamic Access-Internal Routes)

Syntax	<pre>access-internal { route subscriber-ip-address { qualified-next-hop underlying-interface { mac-address address; } } }</pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i>],</p> <p>[edit dynamic-profiles routing-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i>] hierarchy levels introduced in Junos OS Release 10.1.</p>
Description	<p>Dynamically configure access-internal routes. Access-internal routes are optional, but are used instead of access routes if the next-hop address is not specified in the Framed-Route Attribute [22] for IPv4 or the Framed-IPv6-Route attribute [99] for IPv6.</p>
	<div>  <p>BEST PRACTICE: We recommend that you always include the access-internal stanza in the dynamic-profile when the access stanza is present for framed-route support.</p> </div>
	<p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62 • Configuring Dynamic Access-Internal Routes for PPP Subscriber Management on page 62

attribute

Syntax	<code>attribute <i>attribute-number</i>;</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables radius vendor-id]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Configure a RADIUS attribute as a variable in a dynamic profile.
Options	<i>attribute-number</i> —Number of the RADIUS attribute.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring User-Defined CoS Variables in a Dynamic Service Profile</i>

default-value

Syntax	<code>default-value <i>default-value</i>;</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables <i>variable-name</i>]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Configure a default value for a user-defined variable in a dynamic profile. The values that the system uses for these variables are applied when the subscriber authenticates.
Options	<i>default-value</i> —Default value for the variable.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring User-Defined CoS Variables in a Dynamic Service Profile</i>

dynamic-profiles

```

Syntax  dynamic-profiles {
        profile-name {
            class-of-service {
                interfaces {
                    interface-name ;
                }
                unit logical-unit-number {
                    classifiers {
                        type (classifier-name | default);
                    }
                    output-traffic-control-profile (profile-name | $junos-cos-traffic-control-profile);
                    rewrite-rules {
                        dscp (rewrite-name | default);
                        dscp-ipv6 (rewrite-name | default);
                        ieee-802.1 (rewrite-name | default) vlan-tag (outer | outer-and-inner);
                        inet-precedence (rewrite-name | default);
                    }
                }
            }
        }
        scheduler-maps {
            map-name {
                forwarding-class class-name scheduler scheduler-name;
            }
        }
        schedulers {
            (scheduler-name) {
                buffer-size (seconds | percent percentage | remainder | temporal microseconds);
                drop-profile-map loss-priority (any | low | medium-low | medium-high | high)
                    protocol (any | non-tcp | tcp) drop-profile profile-name;
                excess-priority (low | high | $junos-cos-scheduler-excess-priority);
                excess-rate (percent percentage | percent $junos-cos-scheduler-excess-rate);
                overhead-accounting (shaping-mode) <bytes (byte-value)>;
                priority priority-level;
                shaping-rate (rate | predefined-variable);
                transmit-rate (percent percentage | rate | remainder) <exact | rate-limit>;
            }
        }
        traffic-control-profiles profile-name {
            delay-buffer-rate (percent percentage | rate | $junos-cos-delay-buffer-rate);
            excess-rate (percent percentage | proportion value | percent $junos-cos-excess-rate);
            guaranteed-rate (percent percentage | rate | $junos-cos-guaranteed-rate);
            overhead-accounting (shaping-mode) <bytes (byte-value)>;
            scheduler-map map-name;
            shaping-rate (rate | predefined-variable);
        }
    }
    firewall {
        family family {
            fast-update-filter filter-name {
                interface-specific;
                match-order [match-order];
            }
        }
    }

```

```

term term-name {
  from {
    match-conditions;
  }
  then {
    action;
    action-modifiers;
  }
  only-at-create;
}
}
firewall {
  family family {
    fast-update-filter filter-name {
      interface-specific;
      match-order [match-order];
      term term-name {
        from {
          match-conditions;
        }
        then {
          action;
          action-modifiers;
        }
        only-at-create;
      }
    }
    filter filter-name {
      interface-specific;
      term term-name {
        from {
          match-conditions;
        }
        then {
          action;
          action-modifiers;
        }
      }
    }
  }
  policer policer-name {
    filter-specific;
    if-exceeding {
      (bandwidth-limit bps | bandwidth-percent percentage);
      burst-size-limit bytes;
    }
    logical-bandwidth-policer;
    logical-interface-policer;
    physical-interface-policer;
    then {
      policer-action;
    }
  }
}
hierarchical-policer policer-name {
  aggregate {
    if-exceeding {
      bandwidth-limit-limit bps;
      burst-size-limit bytes;
    }
    then {

```

```
        policer-action;
    }
}
premium {
    if-exceeding {
        bandwidth-limit bps;
        burst-size-limit bytes;
    }
    then {
        policer-action;
    }
}
}
three-color-policer policer-name {
    action {
        loss-priority high then discard;
    }
    logical-interface-policer;
    single-rate {
        (color-aware | color-blind);
        committed-burst-size bytes;
        committed-information-rate bps;
        excess-burst-size bytes;
    }
    two-rate {
        (color-aware | color-blind);
        committed-burst-size bytes;
        committed-information-rate bps;
        peak-burst-size bytes;
        peak-information-rate bps;
    }
}
}
}
policy-options {
    prefix-list name {
        ip-addresses;
    }
}
}
interfaces interface-name {
    interface-set interface-set-name {
        interface interface-name {
            unit logical unit number {
                advisory-options {
                    downstream-rate rate;
                    upstream-rate rate;
                }
            }
        }
    }
}
unit logical-unit-number {
    auto-configure {
        agent-circuit-identifier {
            dynamic-profile profile-name;
        }
    }
}
```

```

    }
}
encapsulation (atm-ccc-cell-relay | atm-ccc-vc-mux | atm-cisco-nlpid |
atm-tcc-vc-mux | atm-mlppp-llc | atm-nlpid | atm-ppp-llc | atm-ppp-vc-mux |
atm-snap | atm-tcc-snap | atm-vc-mux | ether-over-atm-llc |
ether-vpls-over-atm-llc | ether-vpls-over-fr | ether-vpls-over-ppp | ethernet |
frame-relay-ccc | frame-relay-ppp | frame-relay-tcc | frame-relay-ether-type |
frame-relay-ether-type-tcc | multilink-frame-relay-end-to-end | multilink-ppp |
ppp-over-ether | ppp-over-ether-over-atm-llc | vlan-bridge | vlan-ccc | vlan-vci-ccc
| vlan-tcc | vlan-vpls);
family family {
    address address;
    filter {
        adf {
            counter;
            input-precedence precedence;
            not-mandatory;
            output-precedence precedence;
            rule rule-value;
        }
        input filter-name (
            precedence precedence;
        )
        output filter-name {
            precedence precedence;
        }
    }
}
rpf-check {
    fail-filter filter-name;
    mode loose;
}
service {
    input {
        service-set service-set-name {
            service-filter filter-name;
        }
        post-service-filter filter-name;
    }
    input-vlan-map {
        inner-tag-protocol-id tpid;
        inner-vlan-id number;
        (push | swap);
        tag-protocol-id tpid;
        vlan-id number;
    }
    output {
        service-set service-set-name {
            service-filter filter-name;
        }
    }
    output-vlan-map {
        inner-tag-protocol-id tpid;
        inner-vlan-id number;
        (pop | swap);
        tag-protocol-id tpid;
        vlan-id number;
    }
}

```

```
    }
  }
  unnumbered-address interface-name <preferred-source-address address>;
}
ppp-options {
  chap;
  pap;
}
vlan-id number;
vlan-tags outer [tpid].vlan-id [inner [tpid].vlan-id];
}
}
interfaces {
  demux0 {...}
}
interfaces {
  pp0 {...}
}
protocols {
  igmp {
    interface interface-name {
      accounting;
      disable;
      group-policy;
      immediate-leave;
      no-accounting;
      promiscuous-mode;
      ssm-map ssm-map-name;
      static {
        group group {
          source source;
        }
      }
      version version;
    }
  }
  mld {
    interface interface-name {
      disable;
      (accounting | no-accounting);
      group-policy;
      immediate-leave;
      oif-map;
      passive;
      ssm-map ssm-map-name;
      static {
        group multicast-group-address {
          exclude;
          group-count number;
          group-increment increment;
          source ip-address {
            source-count number;
            source-increment increment;
          }
        }
      }
    }
  }
  version version;
}
```



```

    }
  }
  router-advertisement {
    interface interface-name {
      current-hop-limit number;
      default-lifetime seconds;
      (managed-configuration | no-managed-configuration);
      max-advertisement-interval seconds;
      min-advertisement-interval seconds;
      (other-stateful-configuration | no-other-stateful-configuration);
      prefix prefix;
      reachable-time milliseconds;
      retransmit-timer milliseconds;
    }
  }
}

routing-instances routing-instance-name {
  interface interface-name;
  routing-options {
    access {
      route prefix {
        next-hop next-hop;
        metric route-cost;
        preference route-distance;
        tag route-tag;
      }
    }
    access-internal {
      route subscriber-ip-address {
        qualified-next-hop underlying-interface {
          mac-address address;
        }
      }
    }
  }
  multicast {
    interface interface-name {
      no-qos-adjust;
    }
  }
}

rib routing-table-name {
  access {
    route prefix {
      next-hop next-hop;
      metric route-cost;
      preference route-distance;
      tag route-tag;
    }
  }
  access-internal {
    route subscriber-ip-address {
      qualified-next-hop underlying-interface {
        mac-address address;
      }
    }
  }
}

```

```

    }
  }
}
routing-options {
  access {
    route prefix {
      next-hop next-hop;
      metric route-cost;
      preference route-distance;
      tag route-tag;
    }
  }
  access-internal {
    route subscriber-ip-address {
      qualified-next-hop underlying-interface {
        mac-address address;
      }
    }
  }
}
multicast {
  interface interface-name {
    no-qos-adjust;
  }
}
}
variables {
  variable-name {
    default-value default-value;
    equals expression;
    mandatory;
    radius {
      vendor-id id {
        attribute attribute-number;
        tag tag-number;
      }
    }
    uid;
    uid-reference;
  }
}
}
}

```

Hierarchy Level [\[edit\]](#)

Release Information Statement introduced in Junos OS Release 9.2.
Support at the **filter**, **policer**, **hierarchical-policer**, **three-color-policer**, and **policy options** hierarchy levels introduced in Junos OS Release 11.4.

Description Create dynamic profiles for use with DHCP or PPP client access.

Options *profile-name*—Name of the dynamic profile; string of up to 80 alphanumeric characters.
The remaining statements are explained separately.

Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a Basic Dynamic Profile on page 41• Configuring Dynamic VLANs Based on Agent Circuit Identifier Information• Dynamic Profiles Overview on page 4

dynamic-profile-options

Syntax	<pre>dynamic-profile-options { versioning; }</pre>
Hierarchy Level	[edit system]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure global dynamic profile options. The remaining statement is explained separately.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Enabling Dynamic Profiles to use Multiple Versions on page 47

equals (Dynamic Profile)

Syntax	<pre>equals <i>expression</i>;</pre>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables <i>variable-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an expression for a user-defined variable that is evaluated at run time and returned as the variable value.
Options	<i>expression</i> —Expression evaluated to return a value for the user-defined variable.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Variable Expressions Overview on page 33• Configuring User-Defined CoS Variables in a Dynamic Service Profile

gres-route-flush-delay (Subscriber Management)

Syntax	gres-route-flush-delay;
Hierarchy Level	[edit system services subscriber-management]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	For a subscriber network configured with either nonstop active routing (NSR) or graceful restart, configure the router to wait 180 seconds (3 minutes) before removing (flushing) static or dynamic access routes and access-internal routes from the forwarding table after a graceful Routing Engine switchover (GRES) has taken place.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Delaying Removal of Access Routes and Access-Internal Routes After Graceful Routing Engine Switchover on page 63• Overview of Access Routes and Access-Internal Routes Removal After Graceful Routing Engine Switchover on page 58

interface (Dynamic Routing Instances)

Syntax	interface <i>interface-name</i> ;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> routing-instances <i>routing-instance-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Assign the specified interface to the dynamically created routing instance.
Options	<i>interface-name</i> —The interface name variable (<i>\$junos-interface-name</i>). The interface name variable is dynamically replaced with the interface the accessing client uses when connecting to the router.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• [edit routing-instances] Hierarchy Level• Configuring a Dynamic Profile for use by a Retailer in the DHCPv4 Solution

mac-address (Dynamic Access-Internal Routes)

Syntax	<code>mac-address address;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access-internal route <i>subscriber-ip-address</i> qualified-next-hop <i>underlying-interface</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access-internal route <i>subscriber-ip-address</i> qualified-next-hop <i>underlying-interface</i>],</p> <p>[edit dynamic-profiles routing-options access-internal route <i>subscriber-ip-address</i> qualified-next-hop <i>underlying-interface</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options route <i>subscriber-ip-address</i> qualified-next-hop <i>underlying-interface</i>] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> route <i>subscriber-ip-address</i> qualified-next-hop <i>underlying-interface</i>] hierarchy levels introduced in Junos OS Release 10.1.</p>
Description	Dynamically configure the MAC address variable for an access-internal route for unnumbered interfaces such as DHCP subscriber interfaces.
Options	<i>address</i> —Either the specific MAC address you want to assign to the access-internal route or the MAC address variable (\$junos-subscriber-mac-address). The MAC address variable is dynamically replaced with the value supplied by DHCP when a subscriber logs in.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62

mandatory

Syntax	mandatory;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables <i>variable-name</i>]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	<p>Configure RADIUS to return a value for a user-defined variable. If RADIUS does not return a value for the variable, the dynamic profile fails.</p> <p>When a dynamic profile has mandatory and non-mandatory variables, configure mandatory variables first in the profile.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring User-Defined CoS Variables in a Dynamic Service Profile</i>

metric (Dynamic Access-Internal Routes)

Syntax	<code>metric route-cost;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access <i>route prefix</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access <i>route prefix</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-options access <i>route prefix</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access <i>route prefix</i>] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access <i>route prefix</i>] hierarchy levels introduced in Junos OS Release 10.1.</p>
Description	Dynamically configure the cost for an access route.
Options	<p><i>route-cost</i>—Either the specific cost you want to assign to the access route or either of the following cost variables:</p> <ul style="list-style-type: none"> • \$junos-framed-route-cost—Cost of an IPv4 access route; the variable is dynamically replaced with the metric value (Subattribute 3) from the RADIUS Framed-Route attribute [22]. • \$junos-framed-route-ipv6-cost—Cost of an IPv6 access route; the variable is dynamically replaced with the metric value (Subattribute 3) from the RADIUS Framed-IPv6-Route attribute [99].
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Access Routes for Subscriber Management on page 60

next-hop (Dynamic Access-Internal Routes)

Syntax	<code>next-hop <i>next-hop</i>;</code>
Hierarchy Level	<code>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access <i>route prefix</i>],</code> <code>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access <i>route prefix</i>],</code> <code>[edit dynamic-profiles <i>profile-name</i> routing-options <i>access route prefix</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.5. Support at the <code>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access route <i>prefix</i>]</code> and <code>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access route <i>prefix</i>]</code> hierarchy levels introduced in Junos OS Release 10.1.
Description	Dynamically configure the next-hop address for an access route. Access routes are typically unnumbered interfaces.
Options	<i>next-hop</i> —Either the specific next-hop address you want to assign to the access route or one of the following next-hop address predefined variables. <ul style="list-style-type: none">For IPv4 access routes, use the variable, \$junos-framed-route-nexthop. The route prefix variable is dynamically replaced with the value in Framed-Route RADIUS attribute [22].For IPv6 access routes, use the variable, \$junos-framed-route-ipv6-nexthop. The variable is dynamically replaced with the value in Framed-IPv6-Route RADIUS attribute [99].
Required Privilege Level	<code>routing</code> —To view this statement in the configuration. <code>routing-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">Configuring Dynamic Access Routes for Subscriber Management on page 60

qualified-next-hop (Subscriber Management)

Syntax	qualified-next-hop <i>interface-name</i> { mac-address <i>address</i> ; }
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access-internal route <i>subscriber-ip-address</i>], [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access-internal route <i>subscriber-ip-address</i>], [edit dynamic-profiles <i>profile-name</i> routing-options access-internal route <i>subscriber-ip-address</i>]
Release Information	Statement introduced in Junos OS Release 9.5. Support at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options route <i>subscriber-ip-address</i>] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> route <i>subscriber-ip-address</i>] hierarchy levels introduced in Junos OS Release 10.1.
Description	Dynamically configure the qualified next-hop and the MAC address for an access-internal route for DHCP and PPP subscriber interfaces.
Options	<i>interface-name</i> —Either the specific interface you want to assign to the access route or the variable, or the \$junos-interface-name variable. The variable is dynamically replaced with the value supplied by DHCP or PPP when a subscriber logs in. The remaining statement is explained separately.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62

predefined-variable-defaults (Dynamic Profiles)

Syntax	<code>predefined-variable-defaults predefined-variable <variable-option> default-value</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Configure default values for the predefined variables that are configured in a dynamic profile. These default values are used when RADIUS does not supply a value.
Options	<p><i>predefined-variable</i>—Name of the predefined variable to which you want to assign a default value. Do not include the junos prefix.</p> <p><i>variable-option</i>—Name of the specific variable option to which you want to assign a default value.</p> <p><i>default-value</i>—Default value that you want to assign to the predefined variable. Only certain predefined variables support multiple default values.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• For a list of predefined variables and options for which you can configure default values, see Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs on page 26• Configuring Default Values for Predefined Variables in a Dynamic Profile on page 52

preference (Subscriber Management)

Syntax	<code>preference route-distance</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access <i>route prefix</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access <i>route prefix</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-options <i>access route prefix</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access <i>route prefix</i>] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access <i>route prefix</i>] hierarchy levels introduced in Junos OS Release 10.1.</p>
Description	Dynamically configure the distance for an access route.
Options	<p><i>route-distance</i>—Either the specific distance you want to assign to the access route or either of the following distance variables:</p> <ul style="list-style-type: none"> • <i>\$junos-framed-route-distance</i>—Distance of an IPv4 access route; the variable is dynamically replaced with the preference value (Subattribute 5) from the RADIUS Framed-Route attribute [22]. • <i>\$junos-framed-route-ipv6-distance</i>—Distance of an IPv6 access route; the variable is dynamically replaced with the preference value (Subattribute 5) from the RADIUS Framed-IPv6-Route attribute [99].
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Access Routes for Subscriber Management on page 60

radius (Dynamic Profiles)

Syntax	<pre>radius { vendor-id id { attribute attribute-number; tag tag-number; } }</pre>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	<p>Configure RADIUS attribute variables in a dynamic profile.</p> <p>The statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring User-Defined CoS Variables in a Dynamic Service Profile</i>

route (Access)

Syntax	<pre>route <i>prefix</i> { next-hop <i>next-hop</i>; metric <i>route-cost</i>; preference <i>route-distance</i>; tag <i>route-tag</i>; }</pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-options access]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access] hierarchy levels introduced in Junos OS Release 10.1.</p>
Description	Dynamically configure the parameters for access routes.
Options	<p><i>prefix</i>—Either the specific route prefix that you want to assign to the access route or one of the following route prefix variables.</p> <ul style="list-style-type: none"> For IPv4 access routes, use the variable, \$junos-framed-route-ip-address-prefix. The route prefix variable is dynamically replaced with the value in Framed-Route RADIUS attribute [22]. For IPv6 access routes, use the variable, \$junos-framed-route-ipv6-address-prefix. The variable is dynamically replaced with the value in Framed-IPv6-Route RADIUS attribute [99]. <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring Dynamic Access Routes for Subscriber Management on page 60

route (Access Internal)

Syntax	<pre>route <i>subscriber-ip-address</i> { next-hop <i>next-hop</i>; qualified-next-hop <i>underlying-interface</i> { mac-address <i>address</i>; } }</pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access-internal],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access-internal],</p> <p>[edit dynamic-profiles <i>profile-name</i> routing-options access-internal]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options access-internal] and [edit dynamic-profiles <i>profile-name</i> routing-instances \$junos-routing-instance routing-options rib <i>routing-table-name</i> access-internal] hierarchy levels introduced in Junos OS Release 10.1.</p>
Description	<p>Dynamically configure parameters for an access-internal route.</p>
Options	<p><i>subscriber-ip-address</i>—Either the specific IP address you want to assign to the access-internal route or the subscriber IP address variable (\$junos-subscriber-ip-address). The subscriber IP address variable is dynamically replaced with the value supplied by DHCP or PPP when a subscriber logs in.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62• Configuring Dynamic Access-Internal Routes for PPP Subscriber Management on page 62

routing-instances

```

Syntax  routing-instances routing-instance-name {
        interface interface-name;
        routing-options {
            access {
                route prefix {
                    metric route-cost;
                    next-hop next-hop;
                    preference route-distance;
                    tag route-tag;
                }
            }
            access-internal {
                route subscriber-ip-address {
                    qualified-next-hop underlying-interface {
                        mac-address address;
                    }
                }
            }
        }
        multicast {
            interface interface-name {
                no-qos-adjust;
            }
        }
        rib routing-table-name {
            access {
                route prefix {
                    metric route-cost;
                    next-hop next-hop;
                    preference route-distance;
                    tag route-tag;
                }
            }
            access-internal {
                route subscriber-ip-address {
                    qualified-next-hop underlying-interface {
                        mac-address address;
                    }
                }
            }
        }
    }

```

Hierarchy Level [edit [dynamic-profiles](#)]

Release Information Statement introduced in Junos OS Release 9.6.
The **routing-options** statement introduced in Junos OS Release 10.1.

Description Dynamically configure an additional routing entity for a router.

Options *routing-instance-name*—The routing instance variable (*\$junos-routing-instance*). The routing instance variable is dynamically replaced with the routing instance the accessing client uses when connecting to the router.



NOTE: Though we do not recommend it, you can also enter a specific name for the routing instance, a maximum of 31 characters.

The remaining statement is explained separately.

Required Privilege Level routing—To view this statement in the configuration.
 routing-control—To add this statement to the configuration.

Related Documentation • *Configuring a Dynamic Profile for use by a Retailer in the DHCPv4 Solution*

routing-options (Dynamic Profiles)

```
Syntax  routing-options {
        access {
            route prefix {
                metric route-cost;
                next-hop next-hop;
                preference route-distance;
                tag route-tag;
            }
        }
        access-internal {
            route subscriber-ip-address {
                qualified-next-hop underlying-interface {
                    mac-address address;
                }
            }
        }
        multicast {
            interface interface-name {
                no-qos-adjust;
            }
        }
        rib routing-table-name {
            access {
                route prefix {
                    metric route-cost;
                    next-hop next-hop;
                    preference route-distance;
                    tag route-tag;
                }
            }
            access-internal {
                route subscriber-ip-address {
                    qualified-next-hop underlying-interface {
                        mac-address address;
                    }
                }
            }
        }
    }
```

Hierarchy Level [edit [dynamic-profiles profile-name](#)],
[edit dynamic-profiles *profile-name* [routing-instances \\$junos-routing-instance](#)]

Release Information Statement introduced in Junos OS Release 9.6.
Support at the [edit [dynamic-profiles profile-name routing-instances \\$junos-routing-instance](#)] hierarchy level introduced in Junos OS Release 10.1.

Description Configure protocol-independent routing properties in a dynamic profile.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- [Configuring Dynamic Access Routes for Subscriber Management on page 60](#)
- [Configuring Dynamic Access-Internal Routes for DHCP Subscriber Management on page 62](#)

subscriber-management (Subscriber Management)

Syntax

```
subscriber-management {  
    enforce-strict-scale-limit-license;  
    gres-route-flush-delay;  
    maintain-subscriber {  
        interface-delete;  
    }  
    traceoptions {  
        file filename <files number> <match regular-expression > <size maximum-file-size>  
        <world-readable | no-world-readable>;  
        flag flag;  
    }  
}
```

Hierarchy Level [edit system services]

Release Information Statement introduced in Junos OS Release 11.1.

Description Configure global services for subscriber management, such as maintaining subscribers and tracing operations.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- [Configuring the Router to Strictly Enforce the Subscriber Scaling License](#)
- [Delaying Removal of Access Routes and Access-Internal Routes After Graceful Routing Engine Switchover on page 63](#)
- [Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events](#)
- [Tracing Subscriber Management Database Operations for Subscriber Access](#)

tag (Dynamic Profiles)

Syntax	<code>tag tag-number;</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables radius vendor-id]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Configure a tag for a RADIUS attribute as a variable in a dynamic profile.
Options	<i>tag-number</i> —Tag number for the RADIUS attribute.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring User-Defined CoS Variables in a Dynamic Service Profile</i>

uid

Syntax	<code>uid;</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables <i>variable-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure a unique ID for parameterized filters in a dynamic profile created for services. The values that the system uses for these variables are applied when the subscriber authenticates.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Dynamic Variables Overview on page 6

uid-reference

Syntax	uid-reference;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables <i>variable-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure a variable that references a unique ID for parameterized filters in a dynamic profile created for services. The values that the system uses for these variables are applied when the subscriber authenticates.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Dynamic Variables Overview on page 6

variables

Syntax	<pre> variables { variable-name { default-value default-value; equals expression; mandatory; radius { vendor-id id { attribute attribute-number; tag tag-number; } } uid; uid-reference; } } </pre>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Configure user-defined variables in a dynamic profile. The values that the system uses for these variables are applied when the subscriber authenticates.
Options	<p><i>variable-name</i>—Name of the variable.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Dynamic Variables Overview on page 6

vendor-id

Syntax	<code>vendor-id id;</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> variables <i>radius</i>]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Configure the vendor ID as a variable in a dynamic profile.
Options	<i>id</i> —Vendor ID for the RADIUS attribute.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring User-Defined CoS Variables in a Dynamic Service Profile


versioning

Syntax	<code>versioning;</code>
Hierarchy Level	[edit system dynamic-profile-options]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enable version support for dynamic profiles on the system.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Enabling Dynamic Profiles to use Multiple Versions on page 47

vlan-id (Dynamic Profiles)

Syntax	<code>vlan-id (<i>number</i> none);</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 9.5. VLAN demux interface support introduced in Junos OS Release 10.2.
Description	For VLAN demux, Fast Ethernet, Gigabit Ethernet, and Aggregated Ethernet interfaces only, bind a 802.1Q VLAN tag ID to a logical interface.
Options	<p><i>number</i>—A valid VLAN identifier. When used in the dynamic-profiles hierarchy, specify the <code>\$junos-vlan-id</code> predefined variable to dynamically obtain the VLAN identifier.</p> <p><i>none</i>—Enable the use of untagged pseudo-wire frames on dynamic interfaces.</p> <p>Range:</p> <ul style="list-style-type: none"> For aggregated Ethernet, 4-port, 8-port, and 12-port Fast Ethernet PICs, and for management and internal Ethernet interfaces, 1 through 1023. For 48-port Fast Ethernet and Gigabit Ethernet PICs, 1 through 4094. VLAN ID 0 is reserved for tagging the priority of frames.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Configuring Static Subscriber Interfaces Using VLAN Demux Interfaces</i> <i>Configuring Dynamic Subscriber Interfaces Using VLAN Demux Interfaces in Dynamic Profiles</i>

vlan-tags

Syntax	<code>vlan-tags outer [<i>tpid</i>].<i>vlan-id</i> [inner [<i>tpid</i>].<i>vlan-id</i>];</code>
Hierarchy Level	<code>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.5. VLAN demux interface support introduced in Junos OS Release 10.2.
Description	For Gigabit Ethernet IQ and IQE interfaces only, binds TPIDs and 802.1Q VLAN tag IDs to a logical interface. You must include the stacked-vlan-tagging statement at the <code>[edit interfaces <i>interface-name</i>]</code> hierarchy level.
<div> NOTE: The inner-range <i>vid1–vid2</i> option is supported on MX Series routers with IQE PICs only.</div>	
Options	<p>inner [<i>tpid</i>].<i>vlan-id</i>—A TPID (optional) and a valid VLAN identifier in the format <i>tpid.vlan-id</i>. When used in the dynamic-profiles hierarchy, specify the \$junos-vlan-id predefined variable to dynamically obtain the VLAN ID.</p> <p>Range: For VLAN ID, 1 through 4094. VLAN ID 0 is reserved for tagging the priority of frames.</p> <p>outer [<i>tpid</i>].<i>vlan-id</i>—A TPID (optional) and a valid VLAN identifier in the format <i>tpid.vlan-id</i>. When used in the dynamic-profiles hierarchy, specify the \$junos-stacked-vlan-id predefined variable.</p> <p>Range: For VLAN ID, 1 through 511 for normal interfaces, and 512 through 4094 for VLAN CCC interfaces. VLAN ID 0 is reserved for tagging the priority of frames.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Dual VLAN Tags</i>• <i>stacked-vlan-tagging</i>

PART 3

Troubleshooting

- [Acquiring Troubleshooting Information on page 117](#)

CHAPTER 8

Acquiring Troubleshooting Information

- [Collecting Subscriber Access Logs Before Contacting Juniper Technical Support on page 117](#)

Collecting Subscriber Access Logs Before Contacting Juniper Technical Support

Problem When you experience a subscriber access problem in your network, we recommend that you collect certain logs before you contact Juniper Technical Support. This topic shows you the most useful logs for a variety of network implementations. In addition to the relevant log information, you must also collect standard troubleshooting information and send it to Juniper Technical Support in your request for assistance.

Solution To collect standard troubleshooting information:

- Redirect the command output to a file.

```
user@host> request support information | save rsi-1
```

To configure logging to assist Juniper Technical Support:

1. Review the following blocks of statements to determine which apply to your configuration.

[edit]

```
set system syslog archive size 100m files 25
set system auto-configuration traceoptions file filename
set system auto-configuration traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions level all
set protocols ppp-service traceoptions flag all
set protocols ppp traceoptions file filename size 100m files 25
set protocols ppp traceoptions level all
set protocols ppp traceoptions flag all
set protocols ppp monitor-session all
set interfaces pp0 traceoptions flag all
set demux traceoptions file filename size 100m files 25
set demux traceoptions level all
set demux traceoptions flag all
set system processes dhcp-service traceoptions file filename
set system processes dhcp-service traceoptions file size 100m
set system processes dhcp-service traceoptions file files 25
set system processes dhcp-service traceoptions flag all
set class-of-service traceoptions file filename
set class-of-service traceoptions file size 100m
set class-of-service traceoptions flag all
set class-of-service traceoptions file files 25
set routing-options traceoptions file filename
set routing-options traceoptions file size 100m
set routing-options traceoptions flag all
set routing-options traceoptions file files 25
set interfaces traceoptions file filename
set interfaces traceoptions file size 100m
set interfaces traceoptions flag all
set interfaces traceoptions file files 25
set system processes general-authentication-service traceoptions file filename
set system processes general-authentication-service traceoptions file size 100m
set system processes general-authentication-service traceoptions flag all
set system processes general-authentication-service traceoptions file files 25
```

2. Copy the relevant statements into a text file and modify the log filenames as you want.
3. Copy the statements from the text file and paste them into the CLI on your router to configure logging.
4. Commit the logging configuration to begin collecting information.



.....

NOTE: The maximum file size for DHCP local server and DHCP relay log files is 1 GB. The maximum number of log files for DHCP local server and DHCP relay is 1000.

.....



BEST PRACTICE: Enable these logs only to collect information when troubleshooting specific problems. Enabling these logs during normal operations can result in reduced system performance.

**Related
Documentation**

- *Compressing Troubleshooting Logs from /var/logs to Send to Juniper Technical Support*

PART 4

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- [Index on page 123](#)

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