CISCO Application Policy Infrastructure Controller Software User Guide

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Contents

Introduction

The Cisco Application Centric Infrastructure (ACI) is an architecture that allows the application to define the networking requirements in a programmatic way. This architecture simplifies, optimizes, and accelerates the entire application deployment lifecycle. Cisco Application Policy Infrastructure Controller (APIC) is the software, or operating system, that acts as the controller.

This document describes the features, issues, and limitations for the Cisco APIC software. For the features, issues, and limitations for the Cisco NX-OS software for the Cisco Nexus 9000 series switches, see the **Cisco Nexus 9000 ACI-Mode Switches Release Notes, Release 15.2(7).**

For more information about this product, see “Related Content.”.

Date	Description
February 21, 2023	Release 5.2(7g) became available. Added the open and resolved bugs for this release.
January 11, 2023	In the Hardware Compatibility Information section, removed APIC-M1 and APIC-L1. The last date of support was October 31, 2021.
November 29, 2022	In the Known Issues section, added: • If you are upgrading to Cisco APIC release 4.2(6o), 4.2(7l), 5.2(1g), or later, ensure that any VLAN encapsulation blocks that you are explicitly using for leaf switch front panel VLAN programming are set as “external (on the wire).” If these VLAN encapsulation blocks are instead set to “internal,” the upgrade causes the front panel port VLAN to be removed, which can result in a data path outage.
November 18, 2022	In the Open Issues section, added bug CSCwc66053.
November 16, 2022	In the Open Issues section, added bug CSCwd26277.
November 9, 2022	Release 5.2(7f) became available.

New Software Features

Feature	Description
N/A	There are no new software features in this release. However, see Changes in Behavior.

New Hardware Features

For the new hardware features, see the **Cisco Nexus 9000 ACI-Mode Switches Release Notes, Release 15.2(7).**

Changes in Behavior

- On the “Interface Configuration” GUI page (Fabric > Access Policies > Interface Configuration), the node table now contains the following columns:
  - Interface Description: The user-entered description of the interface. You can edit the description by clicking … and choosing Edit Interface Configuration.
  - Port Direction: The direction of the port. Possible values are “uplink,” “downlink,” and “default.” The default value is “default,” which indicates that the port uses its default direction. The other values display if you converted the port from uplink to downlink or downlink to uplink.
- There is now a “Switch Configuration” GUI page (Fabric > Access Policies > Switch Configuration) that shows information about the leaf and spine switches controlled by the Cisco APIC. This page also enables you to modify a switch’s configuration to create an access policy group and fabric policy group, or to remove the policy groups from 1 or more nodes. This page is similar to the “Interface

Configuration” GUI page that existed previously, but is for switches.

- On the “Interface Configuration” GUI page (Fabric > Access Policies > Interface Configuration) and “Switch Configuration” page (Fabric > Access Policies > Switch Configuration), if you configured your switches in the Cisco APIC 5.2(5) release or earlier, the following warning message displays near the top of the page:
  Some of the switches are still configured the old way. We can help you migrate them.
  If you click “migrate them” and use the dialog that appears, the Cisco APIC converts the selected switches’ configuration from the method used in the 4.2 and earlier releases to the newer method used in the 5.2 and later releases. The newer configuration is simplified. For example, the configurations no longer have policy selectors. After the conversion, each switch will have an access policy group and fabric policy group. You can expect to have a short duration of traffic loss during the migration.
- On the “Welcome to Access Policies” GUI page (Fabric > Access Policies > Quick Start), work pane now contains the following choices:
  - Configure Interfaces: Used to configure the interfaces on a node.
  - Breakout: Used to configure breakout ports on a node.
  - Create a SPAN Source and Destination: Used to create a SPAN source group.
  - Convert Interfaces: Used to convert interfaces on a node to uplink or downlink ports.
  - Fabric Extender: Used to connect a node to a fabric extender (FEX).

Open Issues

Click the bug ID to access the Bug Search tool and see additional information about the bug. The “Exists In” column of the table specifies the 5.2(7) releases in which the bug exists. A bug might also exist in releases other than the 5.2(7) releases.

Bug ID	Description	Exists in
CSCwd90130	After performing an interface migration from the old selector-based style to th e new per-port configuration, an interface with an active override might not w ork as before the migration.	5.2(7g) and later
CSCwe25534	When an IPv6 address is added as the BGP peer address, the APIC does not validate the IPv6 address if the address contains any letters.	5.2(7g) and later
CSCwe39988	The Cisco APIC GUI becomes unresponsive when there is large configuratio n for given tenant and VRF instance.	5.2(7g) and later

CSCvt99966	A SPAN session with the source type set to “Routed-Outside” goes down. The SPAN configuration is pushed to the anchor or non-anchor nodes, but the interfaces are not pushed due to the following fault: “Failed to configure SPAN with source SpanFL3out due to Source fvIfConn not available”.	5.2(7f) and later
CSCvy40511	Traffic from an endpoint under a remote leaf switch to an external node and its attached external networks is dropped. This occurs if the external node is attached to an L3Out with a vPC and there is a redistribution configuration on the L3Out to advertise the reachability of the external nodes as direct-attached hosts.	5.2(7f) and later
CSCvz72941	While performing ID recovery, id-import gets timed out. Due to this, ID recovery fails.	5.2(7f) and later
CSCvz83636	For a health record query using the last page and a time range, the GUI displays some health records with a creation time that are beyond the time range (such as 24h).	5.2(7f) and later
CSCwa90058	When a VRF-level subnet <fvRtSummSubnet> and instP-level subnet <l3extSubnet> with a summary policy is configured for an overlapping subnet, the routes will get summarized by the configuration that was added first. But, the fault on the configuration that was added last will not be shown in the Cisco APIC GUI.	5.2(7f) and later
CSCwa90084	• Traffic disruption across a vPC pair on a given encapsulation. OR • EPG flood in encap blackholing on a given encapsulation. OR • STP packets received on an encapsulation on a given port are not forwarded on all the leaf switches where the same EPG/same encapsulation is deployed.	5.2(7f) and later
CSCwc11570	In certain configuration sequences, bridge domain routes (and consequently, host routes) are not advertised out of GOLF and ACI Anywhere L3Outs.	5.2(7f) and later

CSCwc66053	Preconfiguration validations for L3Outs that occur whenever a new configuration is pushed to the Cisco APIC might not get triggered.	5.2(7f) and later
CSCwd26277	This issue is observed when you enter or edit the bridge domain name in the consumer connector field. After this, the provider connector will only list the bridge domain that is selected by the consumer connector field.	5.2(7f) and later
CSCwd45200	Hosting server details for AVE endpoints at the operational tab under the EPG is not updated after VM migration.	5.2(7f) and later
CSCwd51537	After changing a VM's name, the name does not get updated for endpoints in the Operational tab of an EPG.	5.2(7f) and later
CSCwd94266	Opflexp DME crashes continuously in leaf switches.	5.2(7f)

Resolved Issues

Bug ID	Description	Fixed in
CSCwd94266	Opflexp DME crashes continuously in leaf switches.	5.2(7g)
CSCwa53478	After migrating a VM between two hosts using VMware vMotion, EPG does not get deployed on the target leaf node. When affected, the fvIfConn managed object corresponding to the missing EPG can be seen on APIC, but it would be missing from the target leaf node when queried.	5.2(7f)
CSCwc47735	There is no feedback to the user in case of an unexpected signal interruption.	5.2(7f)
CSCwc49449	When a maintenance policy has multiple switch nodes, such as vPC pair nodes, an SMU's uninstallation gets stuck in the "queued" state for one of the nodes.	5.2(7f)

Known Issues

Click the bug ID to access the Bug Search tool and see additional information about the bug. The "Exists In" column of the table specifies the 5.2(7) releases in which the bug exists. A bug might also exist in releases other than the 5.2(7) releases.

Bug ID	Description	Exists in
CSCuu11416	An endpoint-to-endpoint ACI policy that uses Layer 2 traffic with an IPv6 header does not get counted within or across ESGs/EPGs.	5.2(7f) and later
CSCvj26666	The “show run leaf|spine <nodeId>” command might produce an error for scaled up configurations.	5.2(7f) and later
CSCvj90385	With a uniform distribution of EPs and traffic flows, a fabric module in slot 25 sometimes reports far less than 50% of the traffic compared to the traffic on fabric modules in non-FM25 slots.	5.2(7f) and later
CSCvm71833	Switch upgrades fail with the following error: Version not compatible.	5.2(7f) and later
CSCvq39764	When you click Restart for the Microsoft System Center Virtual Machine Manager (SCVMM) agent on a scaled-out setup, the service may stop. You can restart the agent by clicking Start.	5.2(7f) and later

CSCvq58953	One of the following symptoms occurs: App installation/enable/disable takes a long time and does not complete. Nomad leadership is lost. The output of the acidiag scheduler logs members command contains the following error: Error querying node status: Unexpected response code: 500 (rpc error: No cluster leader)	5.2(7f) and later
CSCvr89603	The CRC and stomped CRC error values do not match when seen from the APIC CLI compared to the APIC GUI. This is expected behavior. The GUI values are from the history data, whereas the CLI values are from the current data.	5.2(7f) and later
CSCvs19322	Upgrading Cisco APIC from a 3.x release to a 4.x release causes Smart Licensing to lose its registration. Registering Smart Licensing again will clear the fault.	5.2(7f) and later
CSCvs77929	In the 4.x and later releases, if a firmware policy is created with different name than the maintenance policy, the firmware policy will be deleted and a new firmware policy gets created with the same name, which causes the upgrade process to fail.	5.2(7f) and later
CSCvx75380	svcredirDestmon objects get programmed in all of the leaf switches where the service L3Out is deployed, even though the service node may not be connected to some of the leaf switch. There is no impact to traffic.	5.2(7f) and later

CSCvx78018	A remote leaf switch has momentary traffic loss for flushed endpoints as the traffic goes through the tglean path and does not directly go through the spine switch proxy path.	5.2(7f) and later
CSCvy07935	xR IP flush for all endpoints under the bridge domain subnets of the EPG being migrated to ESG. This will lead to a temporary traffic loss on remote leaf switch for all EPGs in the bridge domain. Traffic is expected to recover.	5.2(7f) and later
CSCvy10946	With the floating L3Out multipath recursive feature, if a static route with multipath is configured, not all paths are installed at the non-border leaf switch/non-anchor nodes.	5.2(7f) and later
CSCvy34357	Starting with the 5.2(7) release, the following apps built with the following non-compliant Docker versions cannot be installed nor run: • ConnectivityCompliance 1.2 • SevOneAciMonitor 1.0	5.2(7f) and later
CSCvy45358	The file size mentioned in the status managed object for techsupport “dbgexpTechSupStatus” is wrong if the file size is larger than 4GB.	5.2(7f) and later
CSCvz06118	In the “Visibility and Troubleshooting Wizard,” ERSPAN support for IPv6 traffic is not available.	5.2(7f) and later

CSCvz84444	While navigating to the last records in the various History sub tabs, it is possible to not see any results. The first, previous, next, and last buttons will then stop working too.	5.2(7f) and later
CSCvz85579	VMMmgr process experiences a very high load for an extended period of time that impacts other operations that involve it. The process may consume excessive amount of memory and get aborted. This can be confirmed with the command “dmesg -T | grep oom_reaper” if messages such as the following are reported: oom_reaper: reaped process 5578 (svc_ifc_vmmmgr.)	5.2(7f) and later
CSCwa78573	When the “BGP” branch is expanded in the Fabric > Inventory > POD 1 > Leaf > Protocols > BGP navigation path, the GUI freezes and you cannot navigate to any other page. This occurs because the APIC gets large set of data in response, which cannot be handled by the browser for parts of the GUI that do not have the pagination.	5.2(7f) and later
N/A	If you are upgrading to Cisco APIC release 4.2(6o), 4.2(7l), 5.2(1g), or later, ensure that any VLAN encapsulation blocks that you are explicitly using for leaf switch front panel VLAN programming are set as “external (on the wire).” If these VLAN encapsulation blocks are instead set to “internal,” the upgrade causes the front panel port VLAN to be removed, which can result in a datapath outage.	5.2(7f) and later

N/A	Beginning in Cisco APIC release 4.1(1), the IP SLA monitor policy validates t he IP SLA port value. Because of the validation, when TCP is configured as t he IP SLA type, Cisco APIC no longer accepts an IP SLA port value of 0, whi ch was allowed in previous releases. An IP SLA monitor policy from a previou s release that has an IP SLA port value of 0 becomes invalid if the Cisco API C is upgraded to release 4.1(1) or later. This results in a failure for the configuration import or snapshot rollback. The workaround is to configure a non-zero IP SLA port value before upgradin g the Cisco APIC, and use the snapshot and configuration export that was ta ken after the IP SLA port change.	5.2(7f) and l ater
N/A	If you use the REST API to upgrade an app, you must create a new firmware. OSource to be able to download a new app image.	5.2(7f) and l ater
N/A	In a multipod configuration, before you make any changes to a spine switch, ensure that there is at least one operationally “up” external link that is particip ating in the multipod topology. Failure to do so could bring down the multipod connectivity. For more information about multipod, see the Cisco Application Centric Infrastructure Fundamentals document and the Cisco APIC Getting St arted Guide.	5.2(7f) and l ater
N/A	With a non-english SCVMM 2012 R2 or SCVMM 2016 setup and where the v irtual machine names are specified in non-english characters, if the host is re moved and re-added to the host group, the GUID for all the virtual machines under that host changes. Therefore, if a user has created a micro segmentation endpoint gro up using “VM name” attribute specifying the GUID of respective virtual machi ne, then that micro segmentation endpoint group will not work if the host (hos ting the virtual machines) is removed and re-added to the host group, as the GUID for all the virtual machines would have changed. This does not happen if the virtual name has name specified in all english characters.	5.2(7f) and l ater

N/A	A query of a configurable policy that does not have a subscription goes to the policy distributor. However, a query of a configurable policy that has a subscri ption goes to the policy manager. As a result, if the policy propagation from th e policy distributor to the policy manager takes a prolonged amount of time, t hen in such cases the query with the subscription might not return the policy simply because it has not reached policy manager yet.	5.2(7f) and l ater
N/A	When there are silent hosts across sites, ARP glean messages might not be f orwarded to remote sites if a leaf switch without -EX or a later designation in t he product ID happens to be in the transit path and the VRF is deployed on th at leaf switch, the switch does not forward the ARP glean packet back into th e fabric to reach the remote site. This issue is specific to transit leaf switches without -EX or a later designation in the product ID and does not affect leaf s witches that have -EX or a later designation in the product ID. This issue brea ks the capability of discovering silent hosts.	5.2(7f) and l ater
N/A	Typically, faults are generally raised based on the presence of the BGP route target profile under the VRF table. However, if a BGP route target profile is co nfigured without actual route targets (that is, the profile has empty policies), a fault will not be raised in this situation.	5.2(7f) and l ater
N/A	MPLS interface statistics shown in a switch’s CLI get cleared after an admin or operational down event.	5.2(7f) and l ater
N/A	MPLS interface statistics in a switch’s CLI are reported every 10 seconds. If, f or example, an interface goes down 3 seconds after the collection of the stati stics, the CLI reports only 3 seconds of the statistics and clears all of the othe r statistics.	5.2(7f) and l ater

Virtualization Compatibility Information

This section lists virtua

lization compatibility information for the Cisco APIC software.

- For a table that shows the supported virtualization products, see the **ACI Virtualization Compatibility Matrix.**
- For information about Cisco APIC compatibility with Cisco UCS Director, see the appropriate **Cisco UCS Director Compatibility Matrix** document.
- If you use Microsoft vSwitch and want to downgrade to Cisco APIC Release 2.3(1) from a later release, you first must delete any microsegment EPGs configured with the Match All filter.
- This release supports the following additional virtualization products:

Product	Supported Release	Information Location
Microsoft Hyper-V	2016 Update Rollup 1, 2, 2.1, and 3	N/A
VMM Integration and VMware Distributed Virtual Switch (DVS)	6.5.x	**Cisco ACI Virtualization Guide, Release 5.2(x)**

Hardware Compatibility Information

This release supports the following Cisco APIC servers:

Product ID	Description
APIC-L2	Cisco APIC with large CPU, hard drive, and memory configurations (more than 1000 edge ports)
APIC-L3	Cisco APIC with large CPU, hard drive, and memory configurations (more than 1200 edge ports)
APIC-M2	Cisco APIC with medium-size CPU, hard drive, and memory configurations (up to 1000 edge ports)
APIC-M3	Cisco APIC with medium-size CPU, hard drive, and memory configurations (up to 1200 edge ports)

The following list includes general hardware compatibility information:

- For the supported hardware, see the **Cisco Nexus 9000 ACI-Mode Switches Release Notes, Release 15.2(7).**
- Contracts using matchDscp filters are only supported on switches with “EX” on the end of the switch name. For example, N9K-93108TC-EX.
- When the fabric node switch (spine or leaf) is out-of-fabric, the environmental sensor values, such as Current Temperature, Power Draw, and Power Consumption, might be reported as “N/A.” A status might be reported as “Normal” even when the Current Temperature is “N/A.”
- Switches without -EX or a later designation in the product ID do not support Contract filters with match type “IPv4” or “IPv6.” Only match type “IP” is supported. Because of this, a contract will match both IPv4 and IPv6 traffic when the match type of “IP” is used.

The following table provides compatibility information for specific hardware:

Product ID	Description
Cisco UCS M4-based Cisco APIC	The Cisco UCS M4-based Cisco APIC and previous versions support only the 10G interface. Connecting the Cisco APIC to the Cisco ACI fabric requires a same speed interface on the Cisco ACI leaf switch. You cannot connect the Cisco APIC directly to the Cisco N9332PQ ACI leaf switch, unless you use a 40G to 10G converter (part number CVR-QSFP-SFP10G), in which case the port on the Cisco N9332PQ switch auto-negotiates to 10G without requiring any manual configuration.
Cisco UCS M5-based Cisco APIC	The Cisco UCS M5-based Cisco APIC supports dual speed 10G and 25G interfaces. Connecting the Cisco APIC to the Cisco ACI fabric requires a same speed interface on the Cisco ACI leaf switch. You cannot connect the Cisco APIC directly to the Cisco N9332PQ ACI leaf switch, unless you use a 40G to 10G converter (part number CVR-QSFP-SFP10G), in which case the port on the Cisco N9332PQ switch auto-negotiates to 10G without requiring any manual configuration.
N2348UPQ	To connect the N2348UPQ to Cisco ACI leaf switches, the following options are available: Directly connect the 40G FEX ports on the N2348UPQ to the 40G switch ports on the Cisco ACI leaf switches Break out the 40G FEX ports on the N2348UPQ to 4x10G ports and connect to the 10G ports on all other Cisco ACI leaf switches. **Note**: A fabric uplink port cannot be used as a FEX fabric port.
N9K-C9348GC-FXP	This switch does not read SPROM information if the PSU is in a shut state. You might see an empty string in the Cisco APIC output.
N9K-C9364C-FX	Ports 49-64 do not support 1G SFPs with QSA.
N9K-C9508-FM-E	The Cisco N9K-C9508-FM-E2 and N9K-C9508-FM-E fabric modules in the mixed mode configuration are not supported on the same spine switch.

N9K-C9508-FM-E2	The Cisco N9K-C9508-FM-E2 and N9K-C9508-FM-E fabric modules in the mixed mode configuration are not supported on the same spine switch. The locator LED enable/disable feature is supported in the GUI and not supported in the Cisco ACI NX-OS switch CLI.
N9K-C9508-FM-E2	This fabric module must be physically removed before downgrading to releases earlier than Cisco APIC 3.0(1).
N9K-X9736C-FX	The locator LED enable/disable feature is supported in the GUI and not supported in the Cisco ACI NX-OS Switch CLI.
N9K-X9736C-FX	Ports 29 to 36 do not support 1G SFPs with QSA.

Miscellaneous Compatibility Information

This release supports the following products:

Product	**Supported Release**
Cisco NX-OS	15.2(7)
Cisco UCS Manager	2.2(1c) or later is required for the Cisco UCS Fabric Interconnect and other components, including the BIOS, CIMC, and the adapter.

CIMC HUU ISO	• 4.2(2a) CIMC HUU ISO (recommended) for UCS C220/C240 M5 (APIC-L3/M3) • 4.1(3f) CIMC HUU ISO for UCS C220/C240 M5 (APIC-L3/M3) • 4.1(3d) CIMC HUU ISO for UCS C220/C240 M5 (APIC-L3/M3) • 4.1(2k) CIMC HUU ISO (recommended) for UCS C220/C240 M4 (APIC-L2/M2) • 4.1(2g) CIMC HUU ISO for UCS C220/C240 M4 (APIC-L2/M2) • 4.1(2b) CIMC HUU ISO for UCS C220/C240 M4 (APIC-L2/M2) • 4.1(1g) CIMC HUU ISO for UCS C220/C240 M4 (APIC-L2/M2) and M5 (APIC-L3/M3) • 4.1(1f) CIMC HUU ISO for UCS C220 M4 (APIC-L2/M2) (deferred release) • 4.1(1d) CIMC HUU ISO for UCS C220 M5 (APIC-L3/M3) • 4.1(1c) CIMC HUU ISO for UCS C220 M4 (APIC-L2/M2) • 4.0(4e) CIMC HUU ISO for UCS C220 M5 (APIC-L3/M3) • 4.0(2g) CIMC HUU ISO for UCS C220/C240 M4 and M5 (APIC-L2/M2 and APIC-L3/M3) • 4.0(1a) CIMC HUU ISO for UCS C220 M5 (APIC-L3/M3) • 3.0(4d) CIMC HUU ISO for UCS C220/C240 M3 and M4 (APIC-L2/M2) • 3.0(3f) CIMC HUU ISO for UCS C220/C240 M4 (APIC-L2/M2) • 2.0(13i) CIMC HUU ISO • 2.0(9c) CIMC HUU ISO • 2.0(3i) CIMC HUU ISO
Network Insights Base, Network Insights Advisor, and Network Insights for Resources	For the release information, documentation, and download links, see the **Cisco Network Insights for Data Center** page. For the supported releases, see the **Cisco Data Center Networking Applications Compatibility Matrix.**

- This release supports the partner packages specified in the **L4-L7 Compatibility List Solution Overview** document.
- A known issue exists with the Safari browser and unsigned certificates, which applies when connecting to the Cisco APIC GUI. For more information, see the **Cisco APIC Getting Started Guide, Release 5.2(x).**
- For compatibility with Day-2 Operations apps, see the **Cisco Data Center Networking Applications Compatibility Matrix.**
- Cisco Nexus Dashboard Insights creates a user in Cisco APIC called cisco_SN_NI. This user is used when Nexus Dashboard Insights needs to make any changes or query any information from the Cisco APIC. In the Cisco APIC, navigate to the Audit Logs tab of the System > History page. The cisco_SN_NI user is displayed in the User column.

Related Content

See the **Cisco Application Policy Infrastructure Controller (APIC)** page for the documentation.

The documentation includes installation, upgrade, configuration, programming, and troubleshooting guides, technical references, release notes, and knowledge base (KB) articles, as well as other documentation. KB articles provide information about a specific use case or a specific topic.

By using the “Choose a topic” and “Choose a document type” fields of the APIC documentation website, you can narrow down the displayed documentation list to make it easier to find the desired document.

You can watch videos that demonstrate how to perform specific tasks in the **Cisco APIC on the Cisco Data Center Networking** YouTube channel.

Temporary licenses with an expiry date are available for evaluation and lab use purposes. They are strictly not allowed to be used in production. Use a permanent or subscription license that has been purchased through Cisco for production purposes. For more information, go to **Cisco Data Center Networking Software Subscriptions.**

The following table provides links to the release notes, verified scalability documentation, and new documentation:

Document	Description
Cisco Nexus 9000 ACI-Mode Switches Release Notes, Release 15.2(7)	The release notes for Cisco NX-OS for Cisco Nexus 9000 Series ACI-Mode Switches.
Verified Scalability Guide for Cisco APIC, Release 5.2(7) and Cisco Nexus 9000 Series ACI-Mode Switches, Release 15.2(7)	This guide contains the maximum verified scalability limits for Cisco Application Centric Infrastructure (ACI) parameters for Cisco APIC and Cisco Nexus 9000 Series ACI-Mode Switches.

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, send your comments to **apic-docfeedback@cisco.com**. We appreciate your feedback.

Legal Information

Documents / Resources

	**CISCO Application Policy Infrastructure Controller Software** [pdf] User Guide Application Policy Infrastructure Controller Software, Policy Infrastructure Controller Software, Infrastructure Controller Software, Controller Software, Software