Cisco Application Policy Infrastructure Controller, Release 3.2(2), Release Notes

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.

The *Cisco Application Centric Infrastructure Fundamentals* guide provides complete details about the Cisco ACI, including a glossary of terms that are used in the Cisco ACI.

This document describes the features, caveats, and limitations for the Cisco APIC.

Note: Use this document with the *Cisco NX-OS Release 13.2(2) Release Notes for Cisco Nexus 9000 Series ACI-Mode Switches*, which you can view at the following location:

https://www.cisco.com/c/en/us/support/switches/nexus-9000-series-switches/products-release-notes-list.html

Release notes are sometimes updated with new information about restrictions and caveats. See the following website for the most recent version of this document:

https://www.cisco.com/c/en/us/support/cloud-systems-management/application-policy-infrastructure-controller-apic/tsd-products-support-series-home.html

You can watch videos that demonstrate how to perform specific tasks in the Cisco APIC on the Cisco ACI YouTube channel:

https://www.youtube.com/c/CiscoACIchannel

For the verified scalability limits (except the CLI limits), see the *Verified Scalability Guide* for this release.

For the CLI verified scalability limits, see the *Cisco NX-OS Style Command-Line Interface Configuration Guide* for this release.

You can access these documents from the following website:

https://www.cisco.com/c/en/us/support/cloud-systems-management/application-policy-infrastructure-controller-apic/tsd-products-support-series-home.html

Table 1 shows the online change history for this document.

Table 1 Online History Change

Date	Description
July 5, 2018	Release 3.2(2l) became available.
July 9, 2018	In the Changes in Behavior section, added: The catalog version no longer matches with the Cisco APIC version. The catalog uses a different versioning scheme beginning in this release.

Date	Description
July 24, 2018	3.2(2l): In the Resolved Caveats section, added bug CSCvj66372.
July 28, 2018	3.2(2o): Release 3.2(2o) became available. Added the resolved caveats for this release.
July 30, 2018	3.2(2l): In the Resolved Caveats section, added bug CSCvj81562.
August 15, 2018	3.2(2l): In the Open Caveats section, added bug CSCvk38296.

Contents

This document includes the following sections:

New and Changed Information

This section lists the new and changed features in this release and includes the following topics:

New Software Features

Table 2 New Software Features, Guidelines, and Restrictions

The following table lists the new software features in this release:

Table 2 New Software Features, Guidelines, and Restrictions

Feature	Description	Guidelines and Restrictions
Custom attributes for Microsoft SCVMM microsegments	Microsegmentation with Cisco ACI supports custom attributes for Microsoft SCVMM.	To use a custom attribute, you first must add it as a custom property in Microsoft SCVMM. This enables you to select it while creating the microsegment in the Cisco APIC.
Updates to Traceroute Functionality	The traceroute tool is used to discover the routes that packets actually take when traveling to their destination. With the 3.2(2) release, the following traceroute features are now available: • External-IP-to-Endpoint traceroute policies • External-IP-to- External-IP traceroute policies	None.

Feature	Description	Guidelines and Restrictions
	• icmp6 as an additional IP protocol option For more information, see the *Cisco APIC Troubleshooting Guide*.	
Validations on incoming configurations to a Cisco APIC cluster	In certain situations, an incoming configuration to a Cisco APIC cluster will be validated against inconsistencies, where the validations involve only externally-visible configurations. For example, one level of validation might revolve around duplicate IP addresses, where an Invalid Configuration error message might appear for situations where a duplicate IP address is found with another address, such an l3extRsPathL3OutAtt address.	None.
VMware vSphere 6.7 support for VMware VDS and Cisco ACI Virtual Edge	VMware vSphere version 6.7 supports Cisco ACI Virtual Edge and VMware VDS. VMware vSphere version 6.7 includes vCenter 6.7, ESXi 6.7, and DVS 6.6.	None.

New Hardware Features

For new hardware features, see the *Cisco NX-OS Release 13.2(2) Release Notes for Cisco Nexus 9000 Series ACI-Mode Switches* at the following location:

https://www.cisco.com/c/en/us/support/switches/nexus-9000-series-switches/products-release-notes-list.html

Changes in Behavior

The following are changes in behavior for this release:

- The EP tracker can now locate L3Out endpoints. The tracker results now have fields that are specific to L3Out endpoints. For more information, see the EP tracker online help.
- The catalog version no longer matches with the Cisco APIC version. The catalog uses a different versioning scheme beginning in this release.

Upgrade and Downgrade Information

For upgrade and downgrade considerations for the Cisco APIC, see the Cisco APIC documentation site at the following URL:

https://www.cisco.com/c/en/us/support/cloud-systems-management/application-policy-infrastructure-controller-apic/tsd-products-support-series-home.html

Choose *Cisco APIC Management, Installation, Upgrade, and Downgrade Guide* > *Upgrading and Downgrading the APIC Controller and Switch Software*.

Caveats

This section contains lists of open and resolved caveats and known behaviors.

- Open Caveats
- Resolved Caveats
- Known Behaviors

Open Caveats

This section lists the open caveats. Click the bug ID to access the Bug Search Tool and see additional information about the bug. If a caveat is fixed in a patch of this release, the "Patch Fixed In" column of the tables specifies the release.

Open Caveats in the 3.2(2l) Release

The following table lists the open caveats in this release.

Table 3 Open Caveats in the 3.2(2l) Release

Bug ID	Description	Patch Fixed In
CSCvi95657	On modifying a service parameter, the Cisco APIC sends 2 posts to the backend. The first post deletes all of the folders and parameters. The second post adds all of the remaining modified folders and parameters to the backend. These 2 posts will disrupt the running traffic.	
CSCvj04166	The remote leaf TEP pool cannot be deleted after decommissioning the remote leaf and deleting the remote leaf vPC configuration.	
CSCvj09453	The actrlRule is has the wrong destination.	
CSCvj26666	The "show run leaf|spine <nodeId>" command might produce an error for scaled up configurations.	
CSCvk12786	Apps fail to install/uninstall/run when the cluster is not healthy and nodes are powered down/unreachable without being decommissioned.	
CSCvk38296	When deploying a single node PBR with a one-arm load balancer and without SNAT, the PBR datapath does not work as expected.	

Open Caveats in the 3.2(2o) Release

There are no new open caveats in this release.

Resolved Caveats

This section lists the resolved caveats. Click the bug ID to access the Bug Search Tool and see additional information about the bug.

Resolved Caveats in the 3.2(2l) Release

The following table lists the resolved caveats in this release.

Table 4 Resolved Caveats in the 3.2(2l) Release

Bug ID	Description
CSCvi80360	When configuring a static binding in an EPG, if it is a VPC and the name contains a '-' symbol, the name is not properly displayed in the "EPG members" section. However, the VPC is properly deployed to the leaf switches where it should be configured, with proper VLAN(s).
CSCvi99042	Health Group usage does not show the correct leaf switch information.
CSCvj16058	The Submit button of "Controller upgrade" doesn't work for all of the Cisco APICs. Nothing happens after clicking the Submit button. The API inspector shows that no post occurred.
CSCvj20417	The complete configuration export is missing from Cisco APIC techsupport. The currently-included configuration file (./var/log/dme/oldlog/cli1523061365509/user_config) on APIC1of3 techsupport does not include critical configuration attributes for solving the majority of customer issues.
CSCvj21027	The zoning-rule rule ID is not overwritten when two contracts are applied and 1 gets removed.
CSCvj23488	The user is allowed to configure a BD to use the "oob" VRF instance.
CSCvj26968	A bounds check bypass is possible through exploitation of speculative execution.
CSCvj27263	The TACACS server is reported as unreachable while it is actually active. If you log in with TACACS remote authentication, you will receive a message that the AAA servers are not reachable.
CSCvj29343	The IPX service is not used, but IPX is still present in the Cisco APIC's kernel.
CSCvj29486	The SCVMM agent is failing to push inventory to the Cisco APIC (fault F1669) due to invalid access. The SCVMM agent logs contain the following error messages: 400 (bad request) and "Invalid access, MO: compCtrlr."
CSCvj37138	Fault F115712 is triggering intermittently.
CSCvj40031	The policymgr process continuously crashes.
CSCvj41011	Under Fabric > Inventory > Pod x > Leaf x > Physical Interfaces > ethx/x: Attached VM: too many EPs (#)
CSCvj57616	During a Cisco APIC upgrade, the opflexelem (vleaf_elem) DME on leaf switches restarts due to certificate change even though contents of the keys and certificates are identical. This issue is due to spurious leading/trailing white spaces in the certificate files on the Cisco APIC.
CSCvj58507	In some corner cases, the SSH keys file in APIC becomes empty (size 0) during an upgrade. When this happens, the bootstrap logic does not generate new SSH keys and this results in cluster divergence.
CSCvj58904	The Cisco APIC GUI does not display statistics for AVE endpoints under the EPG > Stats tab. Also, after selecting a specific AVE endpoint, there is no Stats tab present in the Client Endpoint window.

Bug ID	Description
CSCvj66372	The Cisco APICs are fully fit and converged, but configuration changes to a tenant are accepted, but not deployed. However, changes made to other tenants or policies can still be applied and deployed.
CSCvj75897	A fault is raised that specifies problem that occurred while retrieving tagging information for a VMM controller. Inventory pull from the VMware vCenter takes a long time (>10 minutes) and it continuously completes with a partial inventory result. The processing of events from VMware vCenter is delayed, which may result in delays for the downloading of policies to the leaf switches when EPGs are deployed on-demand at the VMM domain. This would affect connectivity for newly deployed VMs or VMs which have been vMotioned.
CSCvj77132	The configured L3Out subnets cannot be seen under the Layer 3 external network, the API inspector does correctly return the l3extsubnet (L3Out subnets) objects, and clicking on the "Networks" folder shows the L3Out subnets.
CSCvj81562	In the Cisco APIC release 3.2(1m), the vmmmgr repeatedly crashes, which leads to the cluster being diverged.
CSCvj89855	There is traffic loss when upgrading or downgrading the Cisco ACI along with the Microsoft SCVMM components, as follows: • While upgrading the Cisco ACI to release 3.2(2)/13.2(2) from an earlier release, there can be traffic loss of 40-120 seconds during the switch software upgrade. • While downgrading the Cisco ACI from release 3.2(2)/13.2(2) to earlier release there can be traffic loss of 40-120 seconds during the switch software downgrade. For information about upgrading and downgrading, see the "Cisco ACI with Microsoft SCVMM" chapter in the *Cisco ACI Virtualization Guide*.

Resolved Caveats in the 3.2(2o) Release

The following table lists the resolved caveats in this release.

Table 5 Resolved Caveats in the 3.2(2o) Release

Bug ID	Description
CSCvj41914	An OpflexP core is seen on the leaf switch or spine switch. The leaf switch or spine switch will recover from this, and there should be no impact other than this core being generated and the the service being restarted.
CSCvj90443	A vPC is assigned duplicate vIP address, resulting in traffic loss.
CSCvj91044	There is an OpFlexP core in stats update. The opflexp process should recover and there should be no service impact.
CSCvk51297	An Openstack VM name is not shown in the EPG operational view.

Bug ID	Description
CSCvk44519	After upgrading to the 3.2(2l) release, the Cisco APICs are fully fit and converged, but configuration changes to firmware groups do not work. The configuration changes are accepted without errors, but the changes are not reflected in the GUI. Other configurations made on shard-32 are also accepted, but appear to fail. This includes (but is not limited to): • Monitoring policies • Techsupports • Firmware/Maintenance groups

Known Behaviors

This section lists caveats that describe known behaviors. Click the Bug ID to access the Bug Search Tool and see additional information about the bug.

Known Behaviors in the 3.2(2l) Release

This section describes known behaviors in this release.

Table 6 Known Behaviors in the 3.2(2l) Release

Bug ID	Description
CSCuo52668	The Cisco APIC does not validate duplicate IP addresses that are assigned to two device clusters. The communication to devices or the configuration of service devices might be affected.
CSCuo79243	In some of the 5-minute statistics data, the count of ten-second samples is 29 instead of 30.
CSCuo79250	The node ID policy can be replicated from an old appliance that is decommissioned when it joins a cluster.
CSCup47703	The DSCP value specified on an external endpoint group does not take effect on the filter rules on the leaf switch.
CSCup79002	The hostname resolution of the syslog server fails on leaf and spine switches over in-band connectivity.
CSCuq21360	Following a FEX or switch reload, configured interface tags are no longer configured correctly.
CSCur39124	Switches can be downgraded to a 1.0(1) version if the imported configuration consists of a firmware policy with a desired version set to 1.0(1).
CSCur71082	If the Cisco APIC is rebooted using the CIMC power reboot, the system enters into fsck due to a corrupted disk.
CSCus15627	The Cisco APIC Service (ApicVMMService) shows as stopped in the Microsoft Service Manager (services.msc in control panel > admin tools > services). This happens when a domain account does not have the correct privilege in the domain to restart the service automatically.
CSCut51929	The traffic destined to a shared service provider endpoint group picks an incorrect class ID (PcTag) and gets dropped.
CSCuu09236	Traffic from an external Layer 3 network is allowed when configured as part of a vzAny (a collection of endpoint groups within a context) consumer.

Bug ID	Description
CSCuu61998	Newly added microsegment EPG configurations must be removed before downgrading to a software release that does not support it.
CSCuu64219	Downgrading the fabric starting with the leaf switch will cause faults such as policy-deployment-failed with fault code F1371.
CSCuw81638	The OpenStack metadata feature cannot be used with Cisco ACI integration with the Juno release (or earlier) of OpenStack due to limitations with both OpenStack and Cisco's ML2 driver.
CSCva32534	Creating or deleting a fabricSetupP policy results in an inconsistent state.
CSCva60439	After a pod is created and nodes are added in the pod, deleting the pod results in stale entries from the pod that are active in the fabric. This occurs because the Cisco APIC uses open source DHCP, which creates some resources that the Cisco APIC cannot delete when a pod is deleted.
CSCva86794	When a Cisco APIC cluster is upgrading, the Cisco APIC cluster might enter the minority status if there are any connectivity issues. In this case, user logins can fail until the majority of the Cisco APICs finish the upgrade and the cluster comes out of minority.
CSCva97082	When downgrading to a 2.0(1) release, the spines and its interfaces must be moved from infra L3out2 to infra L3out1. After infra L3out1 comes up, delete L3out2 and its related configuration, and then downgrade to a 2.0(1) release.
CSCvb39702	No fault gets raised upon using the same encapsulation VLAN in a copy device in tenant common, even though a fault should get raised.
CSCvg41711	In the leaf mode, the command "template route group <group-name> tenant <tenant-name>" fails, declaring that the tenant passed is invalid.
CSCvg79127	When First hop security is enabled on a bridge domain, traffic is disrupted.
CSCvg81856	Cisco ACI Multi-Site Orchestrator BGP peers are down and a fault is raised for a conflicting rtrId on the fvRtdEpP managed object during L3extOut configuration.
CSCvh76076	The PSU SPROM details might not be shown in the CLI upon removal and insertion from the switch.
CSCvh93612	If two intra-EPG deny rules are programmed--—one with the class-eq-deny priority and one with the class-eq-filter priority--—changing the action of the second rule to "deny" causes the second rule to be redundant and have no effect. The traffic still gets denied, as expected.
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.

- 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 participating 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 Started Guide*.
- With a non-english SCVMM 2012 R2 or SCVMM 2016 setup and where the virtual machine names are specified in non-english characters, if the host is removed 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 group using "VM name" attribute specifying the GUID of respective virtual machine, then that micro segmentation endpoint group will not work if the host (hosting 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.

- 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 subscription goes to the policy manager. As a result, if the policy propagation from the policy distributor to the policy manager takes a prolonged amount of time, then in such cases the query with the subscription might not return the policy simply because it has not reached policy manager yet.

Known Behaviors in the 3.2(2o) Release

There are no new known behaviors in this release.

Compatibility Information

The following sections list compatibility information for the Cisco APIC software.

Virtualization Compatibility Information

This section lists virtualization compatibility information for the Cisco APIC software.

- For a table that shows the supported virtualization products, see the ACI Virtualization Compatibility Matrix at the following URL:

  https://www.cisco.com/c/dam/en/us/td/docs/Website/datacenter/aci/virtualization/matrix/virtmatrix.html

- This release supports VMM Integration and VMware Distributed Virtual Switch (DVS) 6.5.x. For more information about guidelines for upgrading VMware DVS from 5.x to 6.x and VMM integration, see the *Cisco ACI Virtualization Guide, Release 3.2(2)* at the following URL:

  https://www.cisco.com/c/en/us/support/cloud-systems-management/application-policy-infrastructure-controller-apic/tsd-products-support-series-home.html

- This release supports the Microsoft System Center Virtual Machine Manager (SCVMM) 2012 Update Rollup 9, 10, and 11 releases and the Microsoft Windows Azure Pack Update Rollup 9, 10, and 11 releases.

- This release supports Microsoft SCVMM Update Rollup 1, 2, 2.1, and 3 releases for SCVMM 2016 and Microsoft Hyper-V 2016.

- For information about Cisco APIC compatibility with Cisco UCS Director, see the appropriate *Cisco UCS Director Compatibility Matrix* document at the following URL:

  https://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-director/products-device-support-tables-list.html

- 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.

Switch Compatibility Information

This section lists switch compatibility information for the Cisco APIC software.

- 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.

- Connecting the Cisco APIC (the controller cluster) to the Cisco ACI fabric requires a 10G 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-negotiate to 10G without requiring any manual configuration.
- The Cisco N9K-X9736C-FX (ports 29 to 36) and Cisco N9K-C9364C-FX (ports 49-64) switches do not support 1G SFPs with QSA.
- Cisco N9K-C9508-FM-E2 fabric modules must be physically removed before downgrading to releases earlier than Cisco APIC 3.0(1).
- The Cisco N9K-C9508-FM-E2 and N9K-X9736C-FX locator LED enable/disable feature is supported in the GUI and not supported in the Cisco ACI NX-OS Switch CLI.
- Contracts using matchDscp filters are only supported on switches with "EX" on the end of the switch name. For example, N9K-93108TC-EX.
- 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 N9K-C9348GC-FXP 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.
- 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."

Adaptive Security Appliance (ASA) Compatibility Information

This section lists ASA compatibility information for the Cisco APIC software.

- This release supports Adaptive Security Appliance (ASA) device package version 1.2.5.5 or later.
- If you are running a Cisco Adaptive Security Virtual Appliance (ASA) version that is prior to version 9.3(2), you must configure SSL encryption as follows:

```
(config)# ssl encryption aes128-sha1
```

Miscellaneous Compatibility Information

This section lists miscellaneous compatibility information for the Cisco APIC software.

- This release supports the following software:
  - Cisco NX-OS Release 13.2(2)
  - Cisco AVS, Release 5.2(1)SV3(3.11)

For more information about the supported AVS releases, see the AVS software compatibility information in the *Cisco Application Virtual Switch Release Notes* at the following URL:

https://www.cisco.com/c/en/us/support/switches/application-virtual-switch/products-release-notes-list.html

- Cisco UCS Manager software release 2.2(1c) or later is required for the Cisco UCS Fabric Interconnect and other components, including the BIOS, CIMC, and the adapter.

- This release supports the following firmware:
  - 2.0(3i) CIMC HUU ISO
  - 2.0(9c) CIMC HUU ISO
  - 2.0(13i) CIMC HUU ISO
  - For UCS C220/C240 M3: 3.0(3e) CIMC HUU ISO (recommended)
  - For UCS C220/C240 M4: 3.0(3f) CIMC HUU ISO (recommended)
- This release supports the partner packages specified in the *L4-L7 Compatibility List Solution Overview* document at the following URL:

  https://www.cisco.com/c/en/us/solutions/data-center-virtualization/application-centric-infrastructure/solution-overview-listing.html
- 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*.
- For compatibility with OpenStack and Kubernetes distributions, see the *Cisco Application Policy Infrastructure Controller OpenStack and Container Plugins, Release 3.2(2), Release Notes.*

Usage Guidelines

The following sections list usage guidelines for the Cisco APIC software.

Virtualization Compatibility Guidelines

This section lists virtualization-related usage guidelines for the Cisco APIC software.

- Do not separate virtual port channel (vPC) member nodes into different configuration zones. If the nodes are in different configuration zones, then the vPCs' modes become mismatched if the interface policies are modified and deployed to only one of the vPC member nodes.
- If you are upgrading VMware vCenter 6.0 to vCenter 6.7, you should first delete the following folder on the VMware vCenter: C:\ProgramData\cisco_aci_plugin.

  If you do not delete the folder and you try to register a fabric again after the upgrade, you will see the following error message:

  Error while saving setting in C:\ProgramData\cisco_aci_plugin\<*user*>_<*domain*>.properties.

  The *user* is the user that is currently logged in to the vSphere Web Client, and *domain* is the domain to which the user belongs. Although you can still register a fabric, you do not have permissions to override settings that

were created in the old VMware vCenter. Enter any changes in the Cisco APIC configuration again after restarting VMware vCenter.

- If the communication between the Cisco APIC and VMware vCenter is impaired, some functionality is adversely affected. The Cisco APIC relies on the pulling of inventory information, updating VDS configuration, and receiving event notifications from the VMware vCenter for performing certain operations.
- After you migrate VMs using a cross-data center VMware vMotion in the same VMware vCenter, you might find a stale VM entry under the source DVS. This stale entry can cause problems, such as host removal failure. The workaround for this problem is to enable "Start monitoring port state" on the vNetwork DVS. See the KB topic "Refreshing port state information for a vNetwork Distributed Virtual Switch" on the VMware Web site for instructions.
- When creating a vPC domain between two leaf switches, both switches must be in the same switch generation. Switches not in the same generation are not compatible vPC peers. The generations are as follows:
  - Generation 1-–Cisco Nexus 9200 and 9300 platform switches without "EX" on the end of the switch name; for example, Cisco Nexus 93120TX.
  - Generation 2-–Cisco Nexus 9300-EX and FX platform switches; for example, Cisco Nexus 93108TC-EX.
- The following Red Hat Virtualization (RHV) guidelines apply:
  - We recommend that you use release 4.1.6 or later.
  - Only one controller (compCtrlr) can be associated with a Red Hat Virtualization Manager (RHVM) data center.
  - Deployment immediacy is supported only as pre-provision.
  - IntraEPG isolation, micro EPGs, and IntraEPG contracts are not supported.
  - Using service nodes inside a RHV domain have not been validated.

GUI Guidelines

This section lists GUI-related usage guidelines for the Cisco APIC software.

- The 

icon in the Cisco APIC opens the menu for Show Me How modules, which provide step-by-step help through specific configurations.
  - If you deviate while in progress of a Show Me How module, you will no longer be able to continue.
  - You must have IPv4 enabled to use the Show Me How modules.
- The Cisco APIC GUI includes an online version of the Quick Start Guide that includes video demonstrations.
- To reach the Cisco APIC CLI from the GUI: choose System > Controllers, highlight a controller, right-click, and choose "launch SSH". To get the list of commands, press the escape key twice.

- The Basic GUI mode is deprecated. We do not recommend using Cisco APIC Basic mode for configuration. However, if you want to use Cisco APIC Basic mode, use the following URL:

  APIC_URL/indexSimple.html

CLI Guidelines

This section lists CLI-related usage guidelines for the Cisco APIC software.

- The output from show commands issued in the NX-OS-style CLI are subject to change in future software releases. We do not recommend using the output from the show commands for automation.
- The CLI is supported only for users with administrative login privileges.
- If FIPS is enabled in the Cisco ACI setups, then SHA256 support is mandatory on the SSH Client. Additionally, to have the SHA256 support, the openssh-client must be running version 6.6.1 or higher.

Layer 2 and Layer 3 Configuration Guidelines

This section lists Layer 2 and Layer 3-related usage guidelines for the Cisco APIC software.

- For Layer 3 external networks created through the API or GUI and updated through the CLI, protocols need to be enabled globally on the external network through the API or GUI, and the node profile for all the participating nodes needs to be added through the API or GUI before doing any further updates through the CLI.
- When configuring two Layer 3 external networks on the same node, the loopbacks need to be configured separately for both Layer 3 networks.
- All endpoint groups (EPGs), including application EPGs and Layer 3 external EPGs, require a domain. Interface policy groups must also be associated with an Attach Entity Profile (AEP), and the AEP must be associated with domains. Based on the association of EPGs to domains and of the interface policy groups to domains, the ports VLANs that the EPG uses are validated. This applies to all EPGs including bridged Layer 2 outside and routed Layer 3 outside EPGs. For more information, see the *Cisco APIC Layer 2 Networking Configuration Guide*.

  Note: When creating static paths for application EPGs or Layer 2/Layer 3 outside EPGs, the physical domain is not required. Upgrading without the physical domain raises a fault on the EPG stating "invalid path configuration."
- In a multipod fabric, if a spine switch in POD1 uses the infra tenant L3extOut-1, the TORs of the other pods (POD2, POD3) cannot use the same infra L3extOut (L3extOut-1) for Layer 3 EVPN control plane connectivity. Each POD must use its own spine switch and infra L3extOut.
- You do not need to create a customized monitoring policy for each tenant. By default, a tenant shares the common policy under tenant common. The Cisco APIC automatically creates a default monitoring policy and enables common observable. You can modify the default policy under tenant common based on the requirements of your fabric.
- The Cisco APIC does not provide IPAM services for tenant workloads.
- Do not mis-configure Control Plane Policing (CoPP) pre-filter entries. CoPP pre-filter entries might impact connectivity to multi-pod configurations, remote leaf switches, and Cisco ACI Multi-Site deployments.
- You cannot use remote leaf switches with Cisco ACI Multi-Site.

IP Address Guidelines

This section lists IP address-related usage guidelines for the Cisco APIC software.

- For the following services, use a DNS-based hostname with out-of-band management connectivity. IP addresses can be used with both in-band and out-of-band management connectivity.
  - Syslog server
  - Call Home SMTP server
  - Tech support export server
  - Configuration export server
  - Statistics export server
- The infrastructure IP address range must not overlap with other IP addresses used in the fabric for in-band and Out-of-band networks.
- If an IP address is learned on one of two endpoints for which you are configuring an atomic counter policy, you should use an IP-based policy and not a client endpoint-based policy.
- A multipod deployment requires the 239.255.255.240 system Global IP Outside (GIPo) to be configured on the inter-pod network (IPN) as a PIM BIDIR range. This 239.255.255.240 PIM BIDIR range configuration on the IPN devices can be avoided by using the Infra GIPo as System GIPo feature. The Infra GIPo as System GIPo feature must be enabled only after upgrading all of the switches in the Cisco ACI fabric, including the leaf switches and spine switches, to the latest Cisco APIC release.
- Cisco ACI does not support a class E address as a VTEP address.

Miscellaneous Guidelines

This section lists miscellaneous usage guidelines for the Cisco APIC software.

- User passwords must meet the following criteria:
  - Minimum length is 8 characters
  - Maximum length is 64 characters
  - Fewer than three consecutive repeated characters
  - At least three of the following character types: lowercase, uppercase, digit, symbol
  - Cannot be easily guessed
  - Cannot be the username or the reverse of the username
  - Cannot be any variation of "cisco", "isco", or any permutation of these characters or variants obtained by changing the capitalization of letters therein
- In some of the 5-minute statistics data, the count of ten-second samples is 29 instead of 30.
- The power consumption statistics are not shown on leaf node slot 1.

- If you defined multiple login domains, you can choose the login domain that you want to use when logging in to a Cisco APIC. By default, the domain drop-down list is empty, and if you do not choose a domain, the DefaultAuth domain is used for authentication. This can result in login failure if the username is not in the DefaultAuth login domain. As such, you must enter the credentials based on the chosen login domain.
- A firmware maintenance group should contain a maximum of 80 nodes.
- When contracts are not associated with an endpoint group, DSCP marking is not supported for a VRF with a vzAny contract. DSCP is sent to a leaf switch along with the actrl rule, but a vzAny contract does not have an actrl rule. Therefore, the DSCP value cannot be sent.
- The Cisco APICs must have 1 SSD and 2 HDDs, and both RAID volumes must be healthy before upgrading to this release. The Cisco APIC will not boot if the SSD is not installed.
- In a multipod fabric setup, if a new spine switch is added to a pod, it must first be connected to at least one leaf switch in the pod. Then the spine switch is able to discover and join the fabric.

  Caution: If you install 1-Gigabit Ethernet (GE) or 10GE links between the leaf and spine switches in the fabric, there is risk of packets being dropped instead of forwarded, because of inadequate bandwidth. To avoid the risk, use 40GE or 100GE links between the leaf and spine switches.
- A maximum of eight span sessions (port only, port-VLAN only, or tenant span only) can be configured at a time in one direction (either ingress or egress). If the direction is both (ingress and egress), the maximum span sessions allowed is four. For a combination of span types, limit the number of sessions to four in one direction.
- For a Cisco APIC REST API query of event records, the Cisco APIC system limits the response to a maximum of 500,000 event records. If the response is more than 500,000 events, it returns an error. Use filters to refine your queries. For more information, see *Cisco APIC REST API Configuration Guide*.
- Subject Alternative Names (SANs) contain one or more alternate names and uses any variety of name forms for the entity that is bound by the Certificate Authority (CA) to the certified public key. These alternate names are called "Subject Alternative Names" (SANs). Possible names include:
  - DNS name
  - IP address
- If a node has port profiles deployed on it, some port configurations are not removed if you decommission the node. You must manually delete the configurations after decommissioning the node to cause the ports to return to the default state. To do this, log into the switch, run the setup-clean-config.sh script, wait for the script to complete, then enter the reload command.
- When using the SNMP trap aggregation feature, if you decommission Cisco APICs, the trap forward server will receive redundant traps.

Related Documentation

The Cisco Application Policy Infrastructure Controller (APIC) documentation can be accessed from the following website:

https://www.cisco.com/c/en/us/support/cloud-systems-management/application-policy-infrastructure-controller-apic/tsd-products-support-series-home.html

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.

The following list provides links to the release notes and verified scalability documentation:

- Verified Scalability
- Cisco ACI Simulator Release Notes
- Cisco NX-OS Release Notes for Cisco Nexus 9000 Series ACI-Mode Switches
- Cisco Application Policy Infrastructure Controller OpenStack and Container Plugins Release Notes
- Cisco Application Virtual Switch Release Notes

New Documentation

This section lists the new Cisco ACI product documents for this release.

- *Cisco ACI Virtual Edge Configuration Guide, Release 1.2(2)*
- *Cisco ACI Virtual Edge Installation Guide, Release 1.2(2)*
- *Cisco ACI Virtual Edge Release Notes, Release 1.2(2)*
- *Cisco ACI Virtualization Guide, Release 3.2(2)*
- *Cisco APIC NX-OS Style CLI Command Reference, Release 3.2(2)*
- *Cisco Application Virtual Switch Configuration Guide, Release 5.2(1)SV3(3.25)*
- *Cisco Application Virtual Switch Installation Guide, Release 5.2(1)SV3(3.25)*
- *Cisco Application Virtual Switch Release Notes, 5.2(1)SV3(3.25)*