Release Notes for Cisco Catalyst 3650 Series Switches, Cisco IOS XE Fuji 16.9.x

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Introduction

Cisco Catalyst 3650 Series Switches are the next generation of enterprise class stackable access layer switches, with the new and improved 160-Gbps StackWise-160. Security and application visibility and control are natively built into the switch.

Cisco Catalyst 3650 Series Switches also support full IEEE 802.3 at Power over Ethernet Plus (PoE+), modular and field replaceable network modules, redundant fans, and power supplies. Cisco Catalyst 3650 Series Switches enhance productivity by enabling applications such as IP telephony and video for a true borderless network experience.

Cisco IOS XE represents the continuing evolution of the preeminent Cisco IOS operating system. The Cisco IOS XE architecture and well-defined set of APIs extend the Cisco IOS software to improve portability across platforms and extensibility outside the Cisco IOS environment. The Cisco IOS XE software retains the same look and feel of the Cisco IOS software, while providing enhanced future-proofing and improved functionality.

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Whats New in Cisco IOS XE Fuji 16.9.8

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.7

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.6

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.5

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.4

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.3a

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.3

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.2

There are no new hardware or software features in this release. For the list of open and resolved caveats in this release, see Caveats, on page 59.

Whats New in Cisco IOS XE Fuji 16.9.1

Software Features in Cisco IOS XE Fuji 16.9.1

Feature Name	Description and License Level Information
AVC Switching: Export input and output interface information	• Support for two predefined directional wired Application Visibility and Control (WDAVC) Flexible NetFlow (FNF) records, ingress and egress, is introduced. • Support for attaching up to two different WDAVC FNF monitors with different records to an interface at the same time is enabled. See System Management → Configuring Application Visibility and Control in a Wired Network . (IP Base and IP Services)
Media Access Control Security (MACsec) port channel support	Provides support for MACsec over port channels for Layer 2 and Layer 3 EtherChannels. See Security → MACsec Encryption . 128-bit—(IP Base and IP Services) 256-bit—(IP Services)
MACsec Key Agreement (MKA) cipher announcement exchange	Support for cipher announcement is enabled. Cipher Announcement allows the supplicant and the authenticator to announce their respective MACsec Cipher Suite capabilities through EAPoL announcements. Two types of EAPoL announcements are supported – Secured announcements and unsecured announcements. See Security → MACsec Encryption . 128-bit—(IP Base and IP Services) 256-bit—(IP Services)

Feature Name	Description and License Level Information
Programmability	The following programmability features are introduced in this release: • Candidate Configuration—A temporary configuration that can be modified without changing running configuration. You can then choose when to update the device's configuration with the candidate configuration, by committing and confirming the candidate configuration. • YANG Data Models—For the list of Cisco IOS XE YANG models available with this release, navigate to https://github.com/YangModels/yang/tree/master/vendor/cisco/xe/1691. Revision statements embedded in the YANG files indicate if there has been a model revision. The *README.md* file in the same github location highlights changes that have been made in the release. • Zero Touch Provisioning (DHCPv6)—Dynamic Host Control Protocol Version 6 (DHCPv6) support is added to the Zero-touch provisioning feature in this release. DHCPv6 is enabled by default, and works on any device that boots without startup configuration. See Programmability Configuration Guide.
Sampled NetFlow	The feature is now available at the LAN Base license level. (LAN Base, IP Base, and IP Services)

Feature Name	Description and License Level Information
Smart Licensing and Device Led Conversion	A cloud-based, software license management solution that allows you to manage and track the status of your license, hardware, and software usage trends. **Note** Starting from this release, Smart Licensing is the default and the only available method to manage licenses. **Important** Starting from Cisco IOS XE Fuji 16.9.1 the Right-To-Use (RTU) licensing mode is deprecated, and the associated **license right-to-use** command is no longer available on the CLI. You can use the device-led conversion feature to convert all existing, traditional licenses, to smart licenses. As part of the conversion process, migration data is sent to Cisco Smart Software Manager. Cisco Smart Software Manager creates license entitlements and deposits them in your user account. See the Cisco Smart Licensing, on page 56 section in this release note document and System Management → Configuring Smart Licensing in the configuration guide. A license level is not applicable.
Transport Layer Security (TLS) Client	Provides secure and reliable signaling and data transfer between two systems or devices, by using secure ports and certificate exchange. (IP Base and IP Services)

New on the Web UI	
These features are introduced on the Web UI in this release	• Multicast—Minor improvements to configuring Internet Group Management Protocol (IGMP) snooping and to set the IGMP timeout. • Open Shortest Path First (OSPF)—Supports OSPF standards-based routing protocol for improved routing of data packets to their destination. • Quality of Service (QoS)—Supports QoS to make your network performance more predictable and bandwidth utilization more effective. • Site Profile—New site profiles for access, distributed, and core switches for easier initial configuration of the device. • Smart Licencing—Supports both online and offline method of license reservation to simplify and automate the management of licenses for your Cisco products. Smart Licensing on the device works with the Cisco Smart Software Manager (Cisco SSM). • Switched Port Analyzer (SPAN)—Supports SPAN to analyze network traffic passing through ports or VLANs.

Important Notes

• Unsupported Features, on page 6
• Complete List of Supported Features, on page 8
• Accessing Hidden Commands, on page 8

Unsupported Features

- 802.1x Configurable username and password for MAC Authentication Bypass (MAB)
- Cisco Group Management Protocol (CGMP)
- Cisco Plug-In for OpenFlow (OpenFlow 1.0 and 1.3) is available in Cisco IOS XE Release 3.7.3E, but is not supported in Cisco IOS XE Fuji 16.8.x.
- Cisco TrustSec 802.1x
- Cisco TrustSec critical authentication
- Cisco Networking Services (CNS) configuration agent
- Converged Access (CA) is not supported beyond Cisco IOS XE Denali 16.3.x.

  On the Cisco Catalyst 3650 Series Switches, CA is supported in the Cisco IOS XE Denali 16.3.x software release, which has extended support for 40 months.
- Command Switch Redundancy
- Device classifier for Auto Smartports (ASP)

- Dynamic Host Configuration Protocol (DHCP) snooping ASCII circuit ID
- DHCP version 6 (DHCPv6) relay source configuration
- Distance Vector Multicast Routing Protocol (DVMRP) tunneling
- Dynamic access ports
- EX SFP Support (GLC-EX-SMD)
- Fallback bridging for non-IP traffic
- IEEE 802.1X-2010 with 802.1AE support
- Improvements in QoS policing rates
- Ingress Strict Priority Queuing (Expedite)
- IPsec
- IP-in-IP (IPIP) Tunneling
- IPsec VPN
- IP SLA Media Operation
- IPv6 support for Internet Key Exchange (IKE) version 2 / IP Security (IPSec) version 3
- IPv6 ready logo phase II - host
- IPv6 static route support on LAN Base images
- IPv6 strict host mode
- Layer 2 tunneling protocol enhancements
- Link-state tracking
- Mesh, FlexConnect, and OfficeExtend access point deployment
- Medianet
- MSE 8.x is not supported with Cisco IOS XE Denali 16.x.x.
- Passive monitoring
- Per VLAN policer
- Performance Monitor (Phase 1)
- Port security on EtherChannels
- Pragmatic General Multicast (PGM)
- RFC 4292 IP-FORWARD-MIB (IPv6 only)
- RFC 4293 IP-MIB (IPv6 only)
- RFC4292/RFC4293 MIBs (IPv6 only)
- RFC5460 DHCPv6 Bulk leasequery

- Stack ports buffer is not shared as part of the shared pool. The dedicated buffer for stack ports can only be used by stack ports.
- Trust boundary configuration
- UniDirectional Link Routing (UDLR)
- VLAN access control lists (VACL) logging of access denied
- Virtual Routing and Forwarding (VRF)-Aware web authentication
- Web-Based Authentication without SVI
- Weighted Random Early Detection (WRED)

Complete List of Supported Features

For the complete list of features supported on a platform, see the Cisco Feature Navigator at https://www.cisco.com/go/cfn.

Accessing Hidden Commands

Starting with Cisco IOS XE Fuji 16.8.1a, as an improved security measure, the way in which hidden commands can be accessed has changed.

Hidden commands have always been present in Cisco IOS XE, but were not equipped with CLI help. This means that entering enter a question mark (?) at the system prompt did not display the list of available commands. Such hidden commands are only meant to assist Cisco TAC in advanced troubleshooting and are therefore not documented. For more information about CLI help, see the *Using the Command-Line Interface → Understanding the Help System* chapter of the Comman Reference document.

Hidden commands are available under:

- Category 1—Hidden commands in privileged or User EXEC mode. Begin by entering the **service internal** command to access these commands.
- Category 2—Hidden commands in one of the configuration modes (global, interface and so on). These commands do not require the **service internal** command.

Further, the following applies to hidden commands under Category 1 and 2:

- The commands have CLI help. Entering enter a question mark (?) at the system prompt displays the list of available commands.

  Note: For Category 1, enter the service internal command before you enter the question mark; you do not have to do this for Category 2.

- The system generates a %PARSER-5-HIDDEN syslog message when the command is used. For example:

```
*Feb 14 10:44:37.917: %PARSER-5-HIDDEN: Warning!!! 'show processes memory old-header '
 is a hidden command.
Use of this command is not recommended/supported and will be removed in future.
```

Apart from category 1 and 2, there remain internal commands displayed on the CLI, for which the system does NOT generate the %PARSER-5-HIDDEN syslog message.

Important We recommend that you use any hidden command only under TAC supervision.

If you find that you are using a hidden command, open a TAC case for help with finding another way of collecting the same information as the hidden command (for a hidden EXEC mode command), or to configure the same functionality (for a hidden configuration mode command) using non-hidden commands.

Supported Hardware

Cisco Catalyst 3650 Series Switches—Model Numbers

Switch Model	Cisco IOS Image	Description
WS-C3650-24TS-L	LAN Base	Stackable 24 10/100/1000 Ethernet downlink ports and four 1-Gigabit SFP (small form-factor pluggable) uplink ports, 250-W power supply
WS-C3650-48TS-L	LAN Base	Stackable 48 10/100/1000 Ethernet downlink ports and four 1-Gigabit SFP uplink ports, 250-W power supply
WS-C3650-24PS-L	LAN Base	Stackable 24 10/100/1000 PoE+ downlink ports, four 1-Gigabit SFP uplink ports, 640-W power supply. PoE+ = Power over Ethernet plus (provides up to 30 W per port).
WS-C3650-48PS-L	LAN Base	Stackable 48 10/100/1000 PoE+ downlink ports, four 1-Gigabit SFP uplink ports, 640-W power supply
WS-C3650-48FS-L	LAN Base	Stackable 48 10/100/1000 Full PoE downlink ports, four 1-Gigabit SFP uplink ports, 1025-W power supply
WS-C3650-24TD-L	LAN Base	Stackable 24 10/100/1000 Ethernet downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-48TD-L	LAN Base	Stackable 48 10/100/1000 Ethernet downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-24PD-L	LAN Base	Stackable 24 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 640-W power supply
WS-C3650-48PD-L	LAN Base	Stackable 48 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 640-W power supply

Switch Model	Cisco IOS Image	Description
WS-C3650-24PDM-L	LAN Base	Stackable 24 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP uplink ports and two 10-Gigabit SFP+ uplink ports, Fixed 640-W power supply
WS-C3650-48FD-L	LAN Base	Stackable 48 10/100/1000 Full PoE downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 1025-W power supply
WS-C3650-48FQ-L	LAN Base	Stackable 48 10/100/1000 Full PoE downlink ports, four 10-Gigabit SFP+ uplink ports, 1025-W power supply
WS-C3650-48FQM-L	LAN Base	Stackable 48 10/100/1000 Full PoE downlink ports, four 10-Gigabit SFP+ uplink ports., Fixed 975-W power supply
WS-C3650-48PQ-L	LAN Base	Stackable 48 10/100/1000 PoE+ downlink ports, four 10-Gigabit SFP+ uplink ports, 640-W power supply
WS-C3650-48TQ-L	LAN Base	Stackable 48 10/100/1000 Ethernet downlink ports, four 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-8X24UQ-L	LAN Base	Stackable 8 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 16 10/100/1000 Cisco UPOE™ downlink ports, four 10-Gigabit uplink SPF+ ports, 1100-W power supply
WS-C3650-12X48UZ-L	LAN Base	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, two 40-Gigabit uplink QSFP+ ports, 1100-W power supply
WS-C3650-12X48UR-L	LAN Base	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, eight 10-Gigabit uplink SFP+ ports, 1100-W power supply
WS-C3650-12X48UQ-L	LAN Base	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, four 10-Gigabit uplink SFP+ ports, 1100-W power supply
WS-C3650-12X48FD-L	LAN Base	Stackable 12 100M/1G/2.5G/5G/10G Full PoE downlink ports, 36 10/100/1000 Full PoE downlink ports, 2 10-Gigabit SFP+ uplink ports, 1100-W power supply
WS-C3650-24TS-S	IP Base	Stackable 24 10/100/1000 Ethernet downlink ports, four 1-Gigabit SFP uplink ports, 250-W power supply

Switch Model	Cisco IOS Image	Description
WS-C3650-48TS-S	IP Base	Stackable 48 10/100/1000 Ethernet downlink ports, four 1-Gigabit SFP uplink ports, 250-W power supply
WS-C3650-24PS-S	IP Base	Stackable 24 10/100/1000 PoE+ downlink ports, four 1-Gigabit SFP uplink ports, 640-W power supply
WS-C3650-48PS-S	IP Base	Stackable 48 10/100/1000 PoE+ downlink ports, four 1-Gigabit SFP uplink ports, 640-W power supply
WS-C3650-48FS-S	IP Base	Stackable 48 10/100/1000 Full PoE downlink ports, four 1-Gigabit SFP uplink ports, 1025-W power supply
WS-C3650-24TD-S	IP Base	Stackable 24 10/100/1000 Ethernet downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-48TD-S	IP Base	Stackable 48 10/100/1000 Ethernet downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-24PD-S	IP Base	Stackable 24 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 640-W power supply
WS-C3650-48PD-S	IP Base	Stackable 48 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 640-W power supply
WS-C3650-24PDM-S	IP Base	Stackable 24 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP uplink ports, two 10-Gigabit SFP+ uplink ports, Fixed 640-W power supply
WS-C3650-48FD-S	IP Base	Stackable 48 10/100/1000 Full PoE downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 1025-W power supply
WS-C3650-48FQ-S	IP Base	Stackable 48 10/100/1000 Full PoE downlink ports, four 10-Gigabit SFP+ uplink ports, 1025-W power supply
WS-C3650-48FQM-S	IP Base	Stackable 48 10/100/1000 Full PoE downlink ports, four 10-Gigabit SFP+ uplink ports, Fixed 975-W power supply
WS-C3650-48PQ-S	IP Base	Stackable 48 10/100/1000 PoE+ downlink ports, four 10-Gigabit SFP+ uplink ports, 640-W power supply
WS-C3650-48TQ-S	IP Base	Stackable 48 10/100/1000 Ethernet downlink ports, four 10-Gigabit SFP+ uplink ports, 250-W power supply

Switch Model	Cisco IOS Image	Description
WS-C3650-8X24UQ-S	IP Base	Stackable 8 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 16 10/100/1000 Cisco UPOE™ downlink ports, four 10-Gigabit uplink SPF+ ports, 1100-W power supply
WS-C3650-12X48UZ-S	IP Base	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, two 40-Gigabit uplink QSFP+ ports, 1100-W power supply
WS-C3650-12X48UR-S	IP Base	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, eight 10-Gigabit uplink SFP+ ports, 1100-W power supply
WS-C3650-12X48UQ-S	IP Base	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, four 10-Gigabit uplink SFP+ ports, 1100-W power supply
WS-C3650-24TS-E	IP Services	Stackable 24 10/100/1000 Ethernet downlink ports, four 1-Gigabit SFP uplink ports, 250-W power supply
WS-C3650-48TS-E	IP Services	Stackable 48 10/100/1000 Ethernet downlink ports, four 1-Gigabit SFP uplink ports, 250-W power supply
WS-C3650-24PS-E	IP Services	Stackable 24 10/100/1000 PoE+ downlink ports, four 1-Gigabit SFP uplink ports, 640-W power supply
WS-C3650-48PS-E	IP Services	Stackable 48 10/100/1000 PoE+ downlink ports, four 1-Gigabit SFP uplink ports, 640-W power supply
WS-C3650-48FS-E	IP Services	Stackable 48 10/100/1000 Full PoE downlink ports, four 1-Gigabit SFP uplink ports, 1025-W power supply
WS-C3650-24TD-E	IP Services	Stackable 24 10/100/1000 Ethernet downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-48TD-E	IP Services	Stackable 48 10/100/1000 Ethernet downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-24PD-E	IP Services	Stackable 24 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 640-W power supply
WS-C3650-48PD-E	IP Services	Stackable 48 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 640-W power supply

Switch Model	Cisco IOS Image	Description
WS-C3650-24PDM-E	IP Services	Stackable 24 10/100/1000 PoE+ downlink ports, two 1-Gigabit SFP uplink ports, two 10-Gigabit SFP+ uplink ports, Fixed 640-W power supply
WS-C3650-48FD-E	IP Services	Stackable 48 10/100/1000 Full PoE downlink ports, two 1-Gigabit SFP and two 10-Gigabit SFP+ uplink ports, 1025-W power supply
WS-C3650-48FQ-E	IP Services	Stackable 48 10/100/1000 Full PoE downlink ports, four 10-Gigabit SFP+ uplink ports, 1025-W power supply
WS-C3650-48FQM-E	IP Services	Stackable 48 10/100/1000 Full PoE downlink ports, four10-Gigabit SFP+ uplink ports, Fixed 975-W power supply
WS-C3650-48PQ-E	IP Services	Stackable 48 10/100/1000 PoE+ downlink ports, four 10-Gigabit SFP+ uplink ports, 640-W power supply
WS-C3650-48TQ-E	IP Services	Stackable 48 10/100/1000 Ethernet downlink ports, four 10-Gigabit SFP+ uplink ports, 250-W power supply
WS-C3650-8X24UQ-E	IP Services	Stackable 8 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 16 10/100/1000 Cisco UPOE™ downlink ports, four 10-Gigabit uplink SPF+ ports, 1100-W power supply
WS-C3650-12X48UZ-E	IP Services	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, two 40-Gigabit uplink QSFP+ ports, 1100-W power supply
WS-C3650-12X48UR-E	IP Services	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, eight 10-Gigabit uplink SFP+ ports, 1100-W power supply
WS-C3650-12X48UQ-E	IP Services	Stackable 12 100M/1G/2.5G/5G/10G Cisco UPOE™ downlink ports, 36 10/100/1000 Cisco UPOE™ downlink ports, four 10-Gigabit uplink SFP+ ports, 1100-W power supply

Optics Modules

Cisco Catalyst Series Switches support a wide range of optics and the list of supported optics is updated on a regular basis. Use the Transceiver Module Group (TMG) Compatibility Matrix tool, or consult the tables at this URL for the latest transceiver module compatibility information: https://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html

Compatibility Matrix

The following table provides software compatibility information.

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Fuji 16.9.8	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See Cisco Prime Infrastructure 3.9 → **Downloads**.
Fuji 16.9.7	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See Cisco Prime Infrastructure 3.9 → **Downloads**.
Fuji 16.9.6	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.4 + PI 3.4 latest maintenance release + PI 3.4 latest device pack See Cisco Prime Infrastructure 3.4→ **Downloads**.
Fuji 16.9.5	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.4 + PI 3.4 latest maintenance release + PI 3.4 latest device pack See Cisco Prime Infrastructure 3.4→ **Downloads**.
Fuji 16.9.4	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.4 + PI 3.4 latest maintenance release + PI 3.4 latest device pack See Cisco Prime Infrastructure 3.4→ **Downloads**.
Fuji 16.9.3	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.4 + PI 3.4 latest maintenance release + PI 3.4 latest device pack See Cisco Prime Infrastructure 3.4→ **Downloads**.

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Fuji 16.9.2	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.4 + PI 3.4 latest maintenance release + PI 3.4 latest device pack See Cisco Prime Infrastructure 3.4→ **Downloads**.
Fuji 16.9.1	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4 Patch 1	5.4 5.5	PI 3.4 + PI 3.4 latest device pack See Cisco Prime Infrastructure 3.4→ **Downloads**.
Fuji 16.8.1a	Not applicable	Not applicable	Not applicable	2.3 Patch 1 2.4	5.4 5.5	PI 3.3 + PI 3.3 latest maintenance release + PI 3.3 latest device pack See Cisco Prime Infrastructure 3.3→ **Downloads**.
Everest 16.6.4	Not applicable	Not applicable	Not applicable	2.2 2.3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack See Cisco Prime Infrastructure 3.1→ **Downloads**.
Everest 16.6.3	Not applicable	Not applicable	Not applicable	2.2 2.3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack See Cisco Prime Infrastructure 3.1→ **Downloads**.
Everest 16.6.2	Not applicable	Not applicable	Not applicable	2.2 2.3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack See Cisco Prime Infrastructure 3.1→ **Downloads**.

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Everest 16.6.1	Not applicable	Not applicable	Not applicable	2.2	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack See Cisco Prime Infrastructure 3.1→ **Downloads**.
Everest 16.5.1a	Not applicable	Not applicable	Not applicable	2.1 Patch 3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack See Cisco Prime Infrastructure 3.1→ **Downloads**.
Denali 16.3.6	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.2 Patch 2(wired and wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1 latest maintenance release 3.1.7 + PI 3.1 latest device pack 16 (Wired). PI update PI 3.1 + PI 3.1 latest maintenance release 3.1.7 + PI 3.1 latest device pack 14 (Wireless). See Cisco Prime Infrastructure 3.1→ **Downloads**.
Denali 16.3.5b	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.2 Patch 2(wired and wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1.5 + PI 3.1.5 update 1 + PI 3.1 latest device pack (Wired) PI 3.1 + PI 3.1 maintenance release 7+ PI 3.1 latest device pack (Wireless) See Cisco Prime Infrastructure 3.1→ **Downloads**.

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Denali 16.3.5	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.2 Patch 2(wired and wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1.5 + PI 3.1.5 update 1 + PI 3.1 latest device pack (Wired) PI 3.1 + PI 3.1 maintenance release 7+ PI 3.1 latest device pack (Wireless) See Cisco Prime Infrastructure 3.1→ **Downloads**.
Denali 16.3.3	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.1 Patch 1 (Wired and Wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1.5 + PI 3.1.5 update 1 + PI 3.1 latest device pack (Wired) PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack (Wireless) See Cisco Prime Infrastructure 3.1→ **Downloads**.
Denali 16.3.2	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.1 Patch 1 (Wired and Wireless)	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack (Wired and Wireless) See Cisco Prime Infrastructure 3.1→ **Downloads**.
Denali 16.3.1	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.0 Patch 3 1.4 Patch 7 1.3 Patch 6 (Wired and Wireless)	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack (Wired and Wireless) See Cisco Prime Infrastructure 3.1→ **Downloads**.
Denali 16.2.2	03.07.02E 03.06.03E [4, on page 19]	8.1.0, 8.2.0	CMX 10.2.2	1.3 Patch 5 (Wired and Wireless)	5.3 5.4	3.1.0 + Device Pack 1 (Wired and Wireless) See Cisco Prime Infrastructure 3.1→ **Downloads**.

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Denali 16.2.1	03.07.03E 03.06.03E [4, on page 19]	8.1.0 8.2.0	CMX 10.2.2	1.3 Patch 5 (Wired and Wireless)	5.3 5.4	3.1.0 (Wired) 3.1.0, 3.0.2 [5, on page 19] + Device Pack 4 + PI 3.0 Technology Pack (Wireless) See Cisco Prime Infrastructure 3.1→ **Downloads**.
Denali 16.1.3	03.07.02E 03.06.03E [4, on page 19]	8.1.0	CMX 10.2.0	1.3 Patch 3 (Wired) 1.4 (Wireless)	5.3 5.4	3.0.2 + Device Pack 5+ PI 3.0 Technology Pack See Cisco Prime Infrastructure 3.0 → **Downloads**.
Denali 16.1.2	03.07.02E 03.06.03E [4, on page 19]	8.1.0	CMX 10.2.0	1.3 Patch 3 (Wired) 1.4 (Wireless)	5.3 5.4	3.0.2 + Device Pack 4 + PI 3.0 Technology Pack See Cisco Prime Infrastructure 3.0 → **Downloads**.
Denali 16.1.1	03.07.02E 03.06.03E [4, on page 19]	8.1.0	CMX 10.2.0	1.3 Patch 3 (Wired) 1.4 (Wireless)	5.3 5.4	3.0.2 + PI 3.0 Device Pack 2 + PI 3.0 Technology Pack See Cisco Prime Infrastructure 3.0 → **Downloads**.
03.07.03E 03.07.02E 03.07.01E 03.07.00E	03.07.03E 03.07.02E 03.07.01E 03.07.00E	8.0 8.0 8.0 7.6	8.0 [3, on page 19]	1.3	5.2 5.3	2.2 See Cisco Prime Infrastructure 2.2 → **Downloads**.

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
03.06.04E 03.06.03E 03.06.02aE 03.06.01E 03.06.00E	03.06.04E 03.06.02aE 03.06.01E 03.06.00E	8.0 7.6	8.0	1.3 1.2	5.2 5.3	2.2 2.2, 2.1.2, or 2.1.1 if MSE is also deployed 2, on page 19 2.1.0 if MSE is not deployed See Cisco Prime Infrastructure 2.2 → **Downloads** and Cisco Prime Infrastructure 2.1 → **Downloads**
03.03.03SE 03.03.02SE 03.03.01SE 03.03.00SE	03.03.03SE 03.03.02SE 03.03.01SE 03.03.00SE	7.5 1, on page 19	7.5	1.2	5.2, 5.3	2.0 See Cisco Prime Infrastructure 2.0 → **Downloads**

Note

1. Prime Infrastructure 2.0 enables you to manage Cisco WLC 7.5.102.0 with the features of Cisco WLC 7.4.110.0 and earlier releases. Prime Infrastructure 2.0 does not support any features of Cisco WLC 7.5.102.0 including the new AP platforms.
2. If MSE is deployed on your network, we recommend that you upgrade to Cisco Prime Infrastructure 2.1.2.
3. Because of SHA-2 certificate implementation, MSE 7.6 is not compatible with Cisco IOS XE Release 3.6E and later. Therefore, we recommend that you upgrade to MSE 8.0.
4. Cisco 5700 (with Cisco IOS XE Release 03.06.03E/Cisco IOS XE Release 03.07.02E) inter-operates as a Peer MC with Catalyst 3650 running Cisco IOS XE Denali 16.1.1.
5. The Cisco IOS XE Denali 16.2.1 features are not available with 3.0.2, but 3.0.2 is compatible with Cisco IOS XE Denali 16.2.1.

Web UI System Requirements

The following subsections list the hardware and software required to access the Web UI:

Minimum Hardware Requirements

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
233 MHz minimum[1]	512 MB[2]	256	1280 x 800 or higher	Small

[1] We recommend 1 GHz
[2] We recommend 1 GB DRAM

Software Requirements

Operating Systems

- Windows 10 or later
- Mac OS X 10.9.5 or later

Browsers

- Google Chrome—Version 59 or later (On Windows and Mac)
- Microsoft Edge
- Mozilla Firefox—Version 54 or later (On Windows and Mac)
- Safari—Version 10 or later (On Mac)

Upgrading the Switch Software

This section covers the various aspects of upgrading or downgrading the device software.



Note You cannot use the Web UI to install, upgrade, or downgrade device software.

Finding the Software Version

The package files for the Cisco IOS XE software are stored on the system board flash device (flash:).

You can use the **show version** privileged EXEC command to see the software version that is running on your switch.



Note Although the **show version** output always shows the software image running on the switch, the model name shown at the end of this display is the factory configuration and does not change if you upgrade the software license.

You can also use the **dir** *filesystem:* privileged EXEC command to see the directory names of other software images that you might have stored in flash memory.

Software Images

Release	Image Type	File Name
Cisco IOS XE Fuji 16.9.8	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.
Cisco IOS XE Fuji 16.9.7	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.
Cisco IOS XE Fuji 16.9.6	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.
Cisco IOS XE Fuji 16.9.5	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.
Cisco IOS XE Fuji 16.9.4	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.
Cisco IOS XE Fuji 16.9.3	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.
Cisco IOS XE Fuji 16.9.2	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.
Cisco IOS XE Fuji 16.9.1	Universal	cat3k_caa-universalk9.16.0
	Universal without Datagram Transport Layer Service (DTLS)	cat3k_caa-universalk9ldpe.

Automatic Boot Loader Upgrade

When you upgrade from any prior Cisco IOS XE 3.x.xE release to a Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.x.x, or Cisco IOS XE Fuji 16.x.x release for the first time, the boot loader may be automatically upgraded, based on the hardware version of the switch. If the boot loader is automatically upgraded, it will take effect on the next reload. If you go back to a Cisco IOS XE Release 3.x.xE, your boot loader will not be downgraded. The updated boot loader supports all previous releases.

For subsequent Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.x.x, or Cisco IOS XE Fuji 16.x.x releases, if there is a new bootloader in the release, it may be automatically upgraded based on the hardware version of the switch when you boot up your switch with the new image for the first time.



Caution Do not power cycle your switch during the upgrade.

Scenario	Automatic Boot Loader Response

If you boot Cisco IOS XE Fuji 16.9.1 or Cisco IOS XE Fuji 16.9.2 or Cisco IOS XE Fuji 16.9.3 or Cisco IOS XE Fuji 16.9.4 or Cisco IOS XE Fuji 16.9.5 or Cisco IOS XE Fuji 16.9.6 or Cisco IOS XE Fuji 16.9.7 or Cisco IOS XE Fuji 16.9.8 for the first time.	The boot loader may be upgraded to version 4.66. For example:
	`ROM: IOS-XE ROMMON`
	`BOOTLDR: CAT3K_CAA Boot Loader (CAT3K_CAA-HBOOT-M) Version 4.66, RELEASE SOFTWARE (P)`
	If the automatic boot loader upgrade occurs, while booting Cisco IOS XE Fuji 16.9.1or Cisco IOS XE Fuji 16.9.2 or Cisco IOS XE Fuji 16.9.3 or Cisco IOS XE Fuji 16.9.4 or Cisco IOS XE Fuji 16.9.5 or Cisco IOS XE Fuji 16.9.6, you will see the following on the console:
	`%IOSXEBOOT-Tue-###: (rp/0): Oct 17 13:07:19 Universal 2017 PLEASE DO NOT POWER CYCLE ### BOOT LOADER UPGRADING 4`
	`%IOSXEBOOT-loader-boot: (rp/0): upgrade successful 4`

Automatic Microcode Upgrade

During a Cisco IOS image upgrade or downgrade on a PoE or UPoE switch, the microcode is updated to reflect applicable feature enhancements and bug fixes. Do not restart the switch during the upgrade or downgrade process.

Starting with Cisco IOS XE Denali 16.1.1 and all later releases:It takes approximately an additional 4 minutes to complete the microcode upgrade in addition to the normal reload time; however, data traffic continues to be forwarded during the upgrade. The microcode update occurs only during an image upgrade or downgrade on PoE or UPoE switches. It does not occur during switch reloads or on non-PoE switches.

The following console messages are displayed during microcode upgrade:

```
MM [1] MCU version 111 sw ver 105
MM [2] MCU version 111 sw ver 105

Front-end Microcode IMG MGR: found 4 microcode images for 1 device.
Image for front-end 0: /tmp/microcode_update/front_end/fe_type_6_0 update needed: no
Image for front-end 0: /tmp/microcode_update/front_end/fe_type_6_1 update needed: yes
Image for front-end 0: /tmp/microcode_update/front_end/fe_type_6_2 update needed: yes
Image for front-end 0: /tmp/microcode_update/front_end/fe_type_6_3 update needed: no

Front-end Microcode IMG MGR: Preparing to program device microcode...
Front-end Microcode IMG MGR: Preparing to program device[0], index=0 ...594412 bytes....
Skipped[0].
Front-end Microcode IMG MGR: Preparing to program device[0], index=1 ...395790 bytes.
Front-end Microcode IMG MGR: Programming device 0...rwRrrrrrrw..
0%.....................................................................
10%.....................................................................
20%.....................................................................
```

```
30%.....................................................................
40%.....................................................................
50%.....................................................................
60%.....................................................................
70%.....................................................................
80%.....................................................................
90%.....................................................................
100%
Front-end Microcode IMG MGR: Preparing to program device[0], index=2 ...25186 bytes.
Front-end Microcode IMG MGR: Programming device
0...rrrrrrw..0%....10%....20%......30%...40%......50%....60%......70%...80%......90%....100%wRr!
Front-end Microcode IMG MGR: Microcode programming complete for device 0.
Front-end Microcode IMG MGR: Preparing to program device[0], index=3 ...86370 bytes....
Skipped[3].
Front-end Microcode IMG MGR: Microcode programming complete in 242 seconds
```

Software Installation Commands

This table of commands is supported in the Cisco IOS XE Release 3.x.xE release train.	
`Device# software`	
auto-upgrade	Initiates auto upgrade for switches running incompatible software
clean	Cleans unused package files from local media
commit	Commits the provisioned software and cancels the automatic rollback timer
expand	Expands a software bundle to local storage, default location is where the bundle currently resides
install	Installs software
rollback	Rolls back the committed software

This table of commands is supported starting from Cisco IOS XE Denali 16.x.x	
`Device# request platform software package ?`	
clean	Cleans unnecessary package files from media
copy	Copies package to media
describe	Describes package content
expand	Expands all-in-one package to media
install	Installs the package
uninstall	Uninstalls the package
verify	Verifies In Service Software Upgrade (ISSU) software package compatibility

Upgrading from Cisco IOS XE Release 3.x.xE in Install Mode

Follow these instructions to upgrade from Cisco IOS XE Release 3.x.xE in install mode:

Before you begin

Note that you can use this procedure for the following upgrade scenarios:

When upgrading from ...	To...
Cisco IOS XE Release 3.x.xE	Cisco IOS XE Fuji 16.x.x or Cisco IOS XE Everest 16.x.x or Cisco IOS XE Denali 16.x.x

The sample output shows upgrade from Cisco IOS XE Release 3.7.3E to Cisco IOS XE Fuji 16.9.1.

Procedure

Step 1 Copy new image to stack

When you expand the image, if you point to the source image on your TFTP server, you can skip this section and go to Step 2: Software install image to flash

a) **show run | i tftp**

Use this command to make sure your tftp server is reachable from IOS via GigabitEthernet0/0.

```
Switch# show run | i tftp
ip tftp source-interface GigabitEthernet0/0
ip tftp blocksize 8192
Switch#
Switch# show run | i ip route vrf
ip route vrf Mgmt-vrf 5.0.0.0 255.0.0.0 5.30.0.1
Switch#
Switch# show run int GigabitEthernet0/0
Building configuration...

Current configuration : 115 bytes
!
interface GigabitEthernet0/0
vrf forwarding Mgmt-vrf
ip address 5.30.12.121 255.255.0.0
negotiation auto
end
Switch#
Switch# ping vrf Mgmt-vrf ip 5.28.11.250
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 5.28.11.250, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/2 ms
```

b) **copy tftp: flash:**

Use this command to copy the image from your tftp server to flash.

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin flash:
cat3k_caa-universalk9.16.09.01.SPA.bin
```

```
Destination filename [cat3k_caa-universalk9.16.09.01.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin...
Loading cat3k_caa-universalk9.16.09.01.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 373203016 bytes]

373203016 bytes copied in 80.662 secs (4626927 bytes/sec)
Switch#
```

c) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash

```
Switch# dir flash:*.bin
Directory of flash:/

32339 -rw- 373217171 Tue Jul 2018 13:52:53 -07:00 cat3k_caa-universalk9.16.09.01.SPA.bin

1562509312 bytes total (731021312 bytes free)
Switch#
```

Step 2 Software install image to flash

a) **software install file**

Use this command with the **new** and **force** options, to expand the target image to flash. You can point to the source image on your TFTP server or in flash if you have it copied to flash.

```
Switch# software install file flash:cat3k_caa-universalk9.16.09.01.SPA.bin new force
Preparing install operation ...
[1]: Copying software from active switch 1 to switches 2,3,4
[1]: Finished copying software to switches 2,3,4
[1 2 3 4]: Starting install operation
[1 2 3 4]: Expanding bundle flash:cat3k_caa-universalk9.16.09.01.SPA.bin
[1 2 3 4]: Copying package files
[1 2 3 4]: Package files copied
[1 2 3 4]: Finished expanding bundle flash:cat3k_caa-universalk9.16.09.01.SPA.bin
[1 2 3 4]: Verifying and copying expanded package files to flash:
[1 2 3 4]: Verified and copied expanded package files to flash:
[1 2 3 4]: Starting compatibility checks
[1 2 3 4]: Bypassing peer package compatibility checks due to 'force' command option
[1 2 3 4]: Finished compatibility checks
[1 2 3 4]: Starting application pre-installation processing
[1 2 3 4]: Finished application pre-installation processing
[1]: Old files list:
Removed cat3k_caa-base.SPA.03.07.03E.pkg
Removed cat3k_caa-drivers.SPA.03.07.03E.pkg
Removed cat3k_caa-infra.SPA.03.07.03E.pkg
Removed cat3k_caa-iosd-universalk9.SPA.152-3.E3.pkg
Removed cat3k_caa-platform.SPA.03.07.03E.pkg
Removed cat3k_caa-wcm.SPA.10.3.130.0.pkg
[2]: Old files list:
Removed cat3k_caa-base.SPA.03.07.03E.pkg
Removed cat3k_caa-drivers.SPA.03.07.03E.pkg
Removed cat3k_caa-infra.SPA.03.07.03E.pkg
Removed cat3k_caa-iosd-universalk9.SPA.152-3.E3.pkg
Removed cat3k_caa-platform.SPA.03.07.03E.pkg
Removed cat3k_caa-wcm.SPA.10.3.130.0.pkg
[3]: Old files list:
Removed cat3k_caa-base.SPA.03.07.03E.pkg
Removed cat3k_caa-drivers.SPA.03.07.03E.pkg
Removed cat3k_caa-infra.SPA.03.07.03E.pkg
```

```
Removed cat3k_caa-iosd-universalk9.SPA.152-3.E3.pkg
Removed cat3k_caa-platform.SPA.03.07.03E.pkg
Removed cat3k_caa-wcm.SPA.10.3.130.0.pkg
[4]: Old files list:
Removed cat3k_caa-base.SPA.03.07.03E.pkg
Removed cat3k_caa-drivers.SPA.03.07.03E.pkg
Removed cat3k_caa-infra.SPA.03.07.03E.pkg
Removed cat3k_caa-iosd-universalk9.SPA.152-3.E3.pkg
Removed cat3k_caa-platform.SPA.03.07.03E.pkg
Removed cat3k_caa-wcm.SPA.10.3.130.0.pkg
[1]: New files list:
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
[2]: New files list:
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
[3]: New files list:
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
[4]: New files list:
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
[1 2 3 4]: Creating pending provisioning file
[1 2 3 4]: Finished installing software. New software will load on reboot.
[1 2 3 4]: Committing provisioning file

[1 2 3 4]: Do you want to proceed with reload? [yes/no]: yes
[1 2 3 4]: Reloading

Switch#
```

Note
Old files listed in the logs should be removed using the **request platform software package clean switch all** command, after reload.

Step 3 Reload

If you said 'Yes' to the prompt in software install and your switches are configured with auto boot, the stack will automatically boot up with the new image. If not, you can manually boot flash:packages.conf

a) **boot flash:packages.conf**

Use this command to manually boot the new image.

Note
When you boot the new image, the boot loader is automatically updated.

```
switch: boot flash:packages.conf
```

b) **show version**

Use this command to verify the version of the new image.

```
Switch# show version
Cisco IOS XE Software, Version 16.09.01
Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M), Version
 16.9.1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Tue 10-Jul-18 06:37 by mcpre
```

c) **delete flash:**

After you have successfully installed the image, you no longer need the .bin image and the file can be deleted from the flash of each switch if it was copied to flash.

```
Switch# delete flash:cat3k_caa-universalk9.16.09.01.SPA.bin
Delete filename [cat3k_caa-universalk9.16.09.01.SPA.bin]?
Delete flash:/cat3k_caa-universalk9.16.09.01.SPA.bin? [confirm]
Switch#
```

Upgrading from Cisco IOS XE Release 3.x.xE in Bundle Mode

Follow these instructions to upgrade from Cisco IOS XE Release 3.x.xE in bundle mode:

Before you begin

Note that you can use this procedure for the following upgrade scenarios:

When upgrading from ...	To...
Cisco IOS XE Release 3.x.xE	Cisco IOS XE Fuji 16.x.x or Cisco IOS XE Everest 16.x.x or Cisco IOS XE Denali 16.x.x

The sample output shows upgrade from Cisco IOS XE Release 3.7.3E to Cisco IOS XE Fuji 16.9.1

Procedure

Step 1 Copy new image to stack

Note
You cannot boot Cisco IOS XE Fuji 16.x.x, Cisco IOS XE Everest 16.x.x, or Cisco IOS XE Denali 16.x.x via TFTP for the first time with a Cisco IOS XE 3.x.xE boot loader. The Cisco IOS XE 3.x.xE boot loaders have a limitation, which prevents the booting of an image larger than 400MB via the TFTP server. Since Cisco IOS XE Fuji 16.x.x, Cisco IOS XE Everest 16.x.x, and Cisco IOS XE Denali 16.x.x images are larger than 400MB, you must boot the image via flash.

a) **show run | i tftp**

Use this command to make sure your tftp server is reachable from IOS via GigabitEthernet0/0.

```
Switch# show run | i tftp
ip tftp source-interface GigabitEthernet0/0
ip tftp blocksize 8192
Switch#
Switch# show run | i ip route vrf
ip route vrf Mgmt-vrf 5.0.0.0 255.0.0.0 5.30.0.1
Switch#
Switch# show run int GigabitEthernet0/0
Building configuration...

Current configuration : 115 bytes
!
interface GigabitEthernet0/0
vrf forwarding Mgmt-vrf
ip address 5.30.12.121 255.255.0.0
negotiation auto
end
Switch#
Switch# ping vrf Mgmt-vrf ip 5.28.11.250
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 5.28.11.250, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/2 ms
```

b) **copy tftp: flash:**

Use this command to copy the image from your tftp server to flash.

Note
If you have a stack, you must copy the image to the flash drive of each switch in the stack.

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin flash:
cat3k_caa-universalk9.16.09.01.SPA.bin
Destination filename [cat3k_caa-universalk9.16.09.01.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin...
Loading cat3k_caa-universalk9.16.09.01.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 373203016 bytes]

373203016 bytes copied in 80.662 secs (4626927 bytes/sec)
Switch#
```

c) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash

```
Switch# dir flash:*.bin
Directory of flash:/

32339 -rw- 373217171 Jul 10 2018 13:52:53 -07:00 cat3k_caa-universalk9.16.09.01.SPA.bin
1562509312 bytes total (731021312 bytes free)
Switch#
```

Step 2 Edit the boot variable

a) **no boot system**

Use this command to clear the boot variable.

```
Switch(config)# no boot system
```

b) **boot system**

Use this command to edit the boot variable, to point to the new image.

```
Switch(config)# boot system flash:cat3k_caa-universalk9.16.09.01.SPA.bin
```

c) **write memory**

Use this command to save configuration changes.

```
Switch# write memory
```

d) **show boot**

Use this command to display and verify that your boot variable is pointing to the new image.

```
Switch# show boot
----------------------------
Switch 1
----------------------------
Current Boot Variables:
BOOT variable = flash:cat3k_caa-universalk9.16.09.01.SPA.bin;

Boot Variables on next reload:
BOOT variable = flash:cat3k_caa-universalk9.16.09.01.SPA.bin;
Allow Dev Key = yes
Manual Boot = yes
Enable Break = yes
Switch#
```

Step 3 Reload

a) **reload**

Use this command to reload the switch.

```
Switch# reload
```

b) **boot flash**

If your switches are configured with auto boot, the stack will automatically boot up with the new image. If not, you can manually boot flash

Note
When you boot the new image, the boot loader is automatically updated.

```
switch:boot flash:cat3k_caa-universalk9.16.09.01.SPA.bin
```

c) **show version**

After the new image boots up, use this command to verify the version of the new image.

```
Switch# show version
Cisco IOS XE Software, Version 16.09.01
Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M), Version
 16.9.1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
```

```
Compiled Tue 10-Jul-18 06:37 by mcpre
```

Step 4 Move from bundle mode to install mode

Ensure you have enough space in flash to expand a new image by cleaning up old installation files. This command will erase your Cisco IOS XE Fuji 16.9.1 bin image file, so ensure that you copy it to your Active again.

a) **request platform software package clean switch all**

Use the **switch all** option to clean up all switches in your stack.

```
Switch# request platform software package clean switch all file flash:
Running command on switch 1
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
done.
Running command on switch 2
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
done.
Running command on switch 3
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
done.
Running command on switch 4
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
done.
The following files will be deleted:
[1]:
/flash/cat3k_caa-base.SPA.03.07.02E.pkg
/flash/cat3k_caa-drivers.SPA.03.07.02E.pkg
/flash/cat3k_caa-infra.SPA.03.07.02E.pkg
/flash/cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
/flash/cat3k_caa-platform.SPA.03.07.02E.pkg
/flash/cat3k_caa-universalk9.16.09.01.SPA.bin
/flash/cat3k_caa-wcm.SPA.10.3.120.0.pkg
/flash/packages.conf
[2]:
/flash/cat3k_caa-base.SPA.03.07.02E.pkg
/flash/cat3k_caa-drivers.SPA.03.07.02E.pkg
/flash/cat3k_caa-infra.SPA.03.07.02E.pkg
/flash/cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
/flash/cat3k_caa-platform.SPA.03.07.02E.pkg
/flash/cat3k_caa-universalk9.16.09.01.SPA.bin
/flash/cat3k_caa-wcm.SPA.10.3.120.0.pkg
/flash/packages.conf
[3]:
/flash/cat3k_caa-base.SPA.03.07.02E.pkg
/flash/cat3k_caa-drivers.SPA.03.07.02E.pkg
/flash/cat3k_caa-infra.SPA.03.07.02E.pkg
/flash/cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
/flash/cat3k_caa-platform.SPA.03.07.02E.pkg
/flash/cat3k_caa-universalk9.16.09.01.SPA.bin
/flash/cat3k_caa-wcm.SPA.10.3.120.0.pkg
/flash/packages.conf
[4]:
/flash/cat3k_caa-base.SPA.03.07.02E.pkg
```

```
/flash/cat3k_caa-drivers.SPA.03.07.02E.pkg
/flash/cat3k_caa-infra.SPA.03.07.02E.pkg
/flash/cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
/flash/cat3k_caa-platform.SPA.03.07.02E.pkg
/flash/cat3k_caa-universalk9.16.09.01.SPA.bin
/flash/cat3k_caa-wcm.SPA.10.3.120.0.pkg
/flash/packages.conf

Do you want to proceed? [y/n]y
[1]:
Deleting file flash:cat3k_caa-base.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-drivers.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-infra.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg ... done.
Deleting file flash:cat3k_caa-platform.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.09.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-wcm.SPA.10.3.120.0.pkg ... done.
Deleting file flash:packages.conf ... done.
SUCCESS: Files deleted.
[2]:
Deleting file flash:cat3k_caa-base.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-drivers.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-infra.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg ... done.
Deleting file flash:cat3k_caa-platform.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.09.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-wcm.SPA.10.3.120.0.pkg ... done.
Deleting file flash:packages.conf ... done.
SUCCESS: Files deleted.
[3]:
Deleting file flash:cat3k_caa-base.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-drivers.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-infra.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg ... done.
Deleting file flash:cat3k_caa-platform.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.09.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-wcm.SPA.10.3.120.0.pkg ... done.
Deleting file flash:packages.conf ... done.
SUCCESS: Files deleted.
[4]:
Deleting file flash:cat3k_caa-base.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-drivers.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-infra.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg ... done.
Deleting file flash:cat3k_caa-platform.SPA.03.07.02E.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.09.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-wcm.SPA.10.3.120.0.pkg ... done.
Deleting file flash:packages.conf ... done.
SUCCESS: Files deleted.
Switch#
```

b) **copy tftp:**

Use this command to copy the image from your tftp server to flash

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin flash:
cat3k_caa-universalk9.16.09.01.SPA.bin
Destination filename [cat3k_caa-universalk9.16.09.01.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin...
Loading cat3k_caa-universalk9.16.09.01.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 373203016 bytes]
```

```
373203016 bytes copied in 80.662 secs (4626927 bytes/sec)
Switch#
```

c) **request platform software package expand**

Use this command to expand the target image to flash and move from bundle mode to install mode. You can point to the source image on your TFTP server or in flash if you have it copied to flash. Use the **switch all** option to upgrade all switches in your stack. Use the **auto-copy** option to copy the .bin image from flash: to all other switches in your stack.

```
Switch# request platform software package expand switch all file
flash:cat3k_caa-universalk9.16.09.01.SPA.bin auto-copy
[1]: Copying flash:cat3k_caa-universalk9.16.09.01.SPA.bin from switch 1 to switch 2 3 4
[2 3 4]: Finished copying to switch 2 3 4
[1 2 3 4]: Expanding file
[1 2 3 4]: Finished expanding all-in-one software package in switch 1 2 3 4
SUCCESS: Finished expanding all-in-one software package.
Switch#
```

Step 5 Edit the boot variable

a) **no boot system**

Use this command to clear the boot variable.

```
Switch(config)# no boot system
```

b) **boot system**

Use this command to edit the boot variable to point to the new image.

```
Switch(config)# boot system flash:packages.conf
```

c) **write memory**

Use this command to save configuration changes.

```
Switch# write memory
```

d) **show boot**

Use this command to display and verify that your boot variable is pointing to the new image.

```
Switch# show boot
----------------------------
Switch 1
----------------------------
Current Boot Variables:
BOOT variable = flash:packages.conf;

Boot Variables on next reload:
BOOT variable = flash:packages.conf;
Manual Boot = yes
Enable Break = yes
Switch#
```

Step 6 Reload

a) **reload**

Use this command to to reload the switch.

```
Switch# reload
```

b) **boot flash**

If your switches are configured with auto boot, the stack will automatically boot up with the new image. If not, you can manually boot flash:packages.conf.

Note
When you boot the new image, the boot loader is automatically updated.

```
switch:boot flash:packages.conf
```

c) **show version**

After the new image boots up, use this command to verify the version of the new image.

```
Switch# show version
Cisco IOS XE Software, Version 16.09.01
Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M), Version
 16.9.1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Tue 10-Jul-18 06:37 by mcpre
```

Upgrading from Cisco IOS XE Denali 16.x.x in Install Mode

Follow these instructions to upgrade from a Cisco IOS XE Denali 16.x.x release to a later release in install mode. .

Before you begin

Note that you can use this procedure for the following upgrade scenarios

When upgrading from ...	To...
Cisco IOS XE Denali 16.x.x	Cisco IOS XE Fuji 16.x.x or Cisco IOS XE Everest 16.x.x or Cisco IOS XE Denali 16.x.x

The sample output shows upgrade from Cisco IOS XE Denali 16.3.5 to Cisco IOS XE Fuji 16.9.1 in install mode.

Procedure

Step 1 Clean Up

a) **request platform software package clean switch all file flash:**

Use this command to clean up old installation files; this ensures that you have sufficient space in the flash drive, to expand a new image. Use the **switch all** option to clean up all switches in your stack.

```
Switch# request platform software package clean switch all file flash:
Running command on switch 1
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat3k_caa-guestshell.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpbase.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-wcm.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.03.05.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 2
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat3k_caa-guestshell.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpbase.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-wcm.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.03.05.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 3
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat3k_caa-guestshell.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpbase.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-wcm.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.03.05.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
```

```
Running command on switch 4
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
packages.conf
File is in use, will not delete.
cat3k_caa-guestshell.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpbase.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-wcm.16.03.05.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.03.05.SPA.pkg
File is in use, will not delete.
packages.conf
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
```

Step 2 Copy new image to stack

Copy the new image to flash: (If you point to the source image on a TFTP server you can skip this section and go to: Software install image to flash).

a) **copy tftp: flash:**

Use this command to copy the image from the tftp server to flash.

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin flash:
cat3k_caa-universalk9.16.09.01.SPA.bin
Destination filename [cat3k_caa-universalk9.16.09.01.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.09.01.SPA.bin...
Loading cat3k_caa-universalk9.16.09.01.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 373203016 bytes]
```

b) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash.

```
Switch# dir flash:*.bin
Directory of flash:/

32339 -rw- 373217171 Jul 10 2018 13:52:53 -07:00 cat3k_caa-universalk9.16.09.01.SPA.bin


1562509312 bytes total (731021312 bytes free)
Switch#
```

Step 3 Set boot variable

a) **boot system flash:packages.conf**

Use this command to set the boot variable to **flash:packages.conf**.

```
Switch(config)# boot system flash:packages.conf
Switch(config)# exit
```

b) **write memory**

Use this command to save boot settings.

```
Switch# write memory
```

c) **show boot system**

Use this command to verify the boot variable is set to **flash:packages.conf**.

The output should display **BOOT variable** = **flash:packages.conf**.

```
Switch# show boot system
```

Step 4 Software install image to flash

a) **request platform software package install**

Use this command to install the target image to flash. Use the **switch all** option to upgrade all switches in your stack. Use the **auto-copy** option to copy the .bin image from flash: to all other switches in your stack

We recommend copying the image to a TFTP server or the flash drive of the active switch. If you point to an image on the flash or USB drive of a member switch (instead of the active), you must specify the exact flash or USB drive - otherwise installation fails. For example, if the image is on the flash drive of member switch 3, the corresponding flash drive is flash-3: `Switch# request platform software package install switch all file flash-3:cat3k_caa-universalk9.16.09.01.SPA.bin new auto-copy`

Note
You must use the **new** option when you upgrade from Cisco IOS XE Denali 16.1.x, 16.2.x or 16.3.1 to Cisco IOS XE Everest 16.x.x or Cisco IOS XE Fuji 16.8.1a, because there are packaging changes in the different 16.x.x releases.

Note
When you execute the command, the following message is displayed. This is expected and does not affect the upgrade. See CSCux82059: `Unknown package type 21`

```
Switch# request platform software package install switch all file
flash:cat3k_caa-universalk9.16.09.01.SPA.bin new auto-copy
Expanding image file: flash:cat3k_caa-universalk9.16.09.01.SPA.bin
[1]: Copying flash:cat3k_caa-universalk9.16.08.01.SPA.bin from switch 1 to switch 2 3 4
[2 3 4]: Finished copying to switch 2 3 4
[1 2 3 4]: Expanding file
[1 2 3 4]: Finished expanding all-in-one software package in switch 1 2 3 4
SUCCESS: Finished expanding all-in-one software package.
[1 2 3 4]: Performing install
Unknown package type 21
Unknown package type 21
Unknown package type 21
Unknown package type 21
SUCCESS: install Finished
[1]: install package(s) on switch 1
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-guestshell.16.03.05.SPA.pkg
Removed cat3k_caa-rpbase.16.03.05.SPA.pkg
Removed cat3k_caa-rpcore.16.03.05.pkg
Removed cat3k_caa-srdriver.16.03.05.SPA.pkg
Removed cat3k_caa-wcm.16.03.05.SPA.pkg
Removed cat3k_caa-webui.16.03.05.SPA.pkg
New files list:
```

```
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[1]: Finished install successful on switch 1
[2]: install package(s) on switch 2
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-guestshell.16.03.05.SPA.pkg
Removed cat3k_caa-rpbase.16.03.05.SPA.pkg
Removed cat3k_caa-rpcore.16.03.05.pkg
Removed cat3k_caa-srdriver.16.03.05.SPA.pkg
Removed cat3k_caa-wcm.16.03.05.SPA.pkg
Removed cat3k_caa-webui.16.03.05.SPA.pkg
New files list:
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[2]: Finished install successful on switch 2
[3]: install package(s) on switch 3
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-guestshell.16.03.05.SPA.pkg
Removed cat3k_caa-rpbase.16.03.05.SPA.pkg
Removed cat3k_caa-rpcore.16.03.05.pkg
Removed cat3k_caa-srdriver.16.03.05.SPA.pkg
Removed cat3k_caa-wcm.16.03.05.SPA.pkg
Removed cat3k_caa-webui.16.03.05.SPA.pkg
New files list:
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[3]: Finished install successful on switch 3
[4]: install package(s) on switch 4
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-guestshell.16.03.05.SPA.pkg
Removed cat3k_caa-rpbase.16.03.05.SPA.pkg
Removed cat3k_caa-rpcore.16.03.05.pkg
Removed cat3k_caa-srdriver.16.03.05.SPA.pkg
Removed cat3k_caa-wcm.16.03.05.SPA.pkg
Removed cat3k_caa-webui.16.03.05.SPA.pkg
New files list:
Added cat3k_caa-rpbase.16.09.01.SPA.pkg
Added cat3k_caa-rpcore.16.09.01.SPA.pkg
Added cat3k_caa-srdriver.16.09.01.SPA.pkg
Added cat3k_caa-guestshell.16.09.01.SPA.pkg
Added cat3k_caa-webui.16.09.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[4]: Finished install successful on switch 4
Checking status of install on [1 2 3 4]
[1 2 3 4]: Finished install in switch 1 2 3 4
```

```
SUCCESS: Finished install: Success on [1 2 3 4]
Switch#
```

Note
Old files listed in the logs will not be removed from flash.

b) **dir flash:**

After you have successfully installed the software, use this command to verify that the flash partition has five new .pkg files and one updated packages.conf file. See sample output below:

```
Switch# dir flash:*.pkg
Directory of flash:/*.pkg

Directory of flash:/

7747  -rw- 281076014 Mar 27 2016 22:15:50 +00:00 cat3k_caa-guestshell.16.03.05.SPA.pkg
7748  -rw- 7197312   Mar 27 2016 22:15:51 +00:00 cat3k_caa-rpbase.16.03.05.SPA.pkg
7749  -rw- 166767220 Mar 27 2016 22:15:51 +00:00 cat3k_caa-rpcore.16.03.05.pkg
7750  -rw- 14631548  Mar 27 2016 22:15:51 +00:00 cat3k_caa-srdriver.16.03.05.SPA.pkg
31000 -rw- 22173354  Mar 27 2016 04:40:38 -07:00 cat3k_caa-wcm.16.03.05.SPA.pkg
30996 -rw- 266177140 Mar 27 2017 04:40:36 -07:00 cat3k_caa-webui.16.03.05.SPA.pkg
30998 -rw- 9067132   Jul 10 2018 04:40:37 -07:00 cat3k_caa-rpbase.16.09.01.SPA.pkg
30999 -rw- 178403952 Jul 10 2018 04:40:38 -07:00 cat3k_caa-rpcore.16.09.01.SPA.pkg
30997 -rw- 13333112  Jul 10 2018 04:40:39 -07:00 cat3k_caa-srdriver.16.09.01.SPA.pkg
30994 -rw- 13333112  Jul 10 2018 04:40:40 -07:00 cat3k_caa-guestshell.16.09.01.SPA.pkg
30994 -rw- 13333112  Jul 10 2018 04:40:41 -07:00 cat3k_caa-webui.16.09.01.SPA.pkg
1621966848 bytes total (132620288 bytes free)


Switch# dir flash:*.conf
Directory of flash:/packages.conf

32342 -rw- 4690 Jul 10 2018 04:40:42 -07:00 packages.conf

1562509312 bytes total (730988544 bytes free)
Switch#
```

c) **dir flash:*.bin**

After you have successfully installed the image, you no longer need the.bin image. If you copied the file to flash, use this command to check if it is still saved in the the flash of each switch.

```
Switch# dir flash:*.bin
Directory of flash:/

32339 -rw- 373217171 Jul 10 2018 13:52:53 -07:00 cat3k_caa-universalk9.16.09.01.SPA.bin


1562509312 bytes total (731021312 bytes free)
Switch#
```

d) **delete flash:**

If an image is still saved, use this command to delete it, if not, it has been deleted as part of the install operation and you can skip this step.

```
Switch# delete flash:cat3k_caa-universalk9.16.09.01.SPA.bin
Delete filename [cat3k_caa-universalk9.16.09.01.SPA.bin]?
Delete flash:/ cat3k_caa-universalk9.16.09.01.SPA.bin? [confirm]
```

```
Switch#
```

Step 5 Reload

a) **reload**

Use this command in the privileged EXEC mode to reload the switch.

```
Switch# reload
```

b) **boot flash:**

If the switch is configured with auto boot, then the stack automatically boots up with the new image. If not, you can manually boot flash:packages.conf

```
switch:boot flash:packages.conf
```

c) **show version**

Use this command to verify the version of the new image.

```
Switch# show version
Cisco IOS XE Software, Version 16.09.01
Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M), Version
 16.9.1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Tue 10-Jul-18 06:37 by mcpre
```

Upgrading or Downgrading from Cisco IOS XE Fuji 16.9.1 in Install Mode

Follow these instructions to upgrade or downgrade from Cisco IOS XE Fuji 16.9.1, in install mode.

Before you begin

Note that you can use this procedure for the following upgrade and downgrade scenarios:

When upgrading from ...	To...
Cisco IOS XE Fuji 16.9.1	A future Cisco IOS XE 16.x.x release.

When downgrading from ...	To...
Cisco IOS XE Fuji 16.9.1	An earlier Cisco IOS XE 16.x.x release.

The sample output covers an upgrade scenario; the same steps apply when you downgrade as well.

Procedure

Step 1 Clean Up

a) **request platform software package clean**

Use this command to clean up old installation files; this ensures that you have sufficient space in the flash drive, to expand a new image. Use the **switch all** option to clean up all switches in your stack.

```
Switch# request platform software package clean switch all file flash:
Running command on switch 1
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
packages.conf
File is in use, will not delete.
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 2
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
packages.conf
File is in use, will not delete.
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 3
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
packages.conf
File is in use, will not delete.
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 4
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
packages.conf
File is in use, will not delete.
```

```
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
done.
SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Switch#
```

Step 2 Copy new image to stack

Copy the new image to flash: (If you point to the source image on a TFTP server you can skip this section and go to: Software install image to flash).

a) **copy tftp: flash:**

Use this command to copy the image from your tftp server to flash.

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.16.10.01.SPA.bin flash:
Destination filename [cat3k_caa-universalk9.16.10.01.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.10.01.SPA.bin...
Loading cat3k_caa-universalk9.16.10.01.SPA.bin from 5.28.11.250 (via GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 465466221 bytes]

465466221 bytes copied in 118.175 secs (3938788 bytes/sec)
Switch#
```

b) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash.

```
Switch# dir flash:*.bin
Directory of flash:/*.bin

Directory of flash:/

7759 -rw- 465466221 Jul 10 2018 04:35:43 +00:00 cat3k_caa-universalk9.16.10.01.SPA.bin
1621966848 bytes total (598597632 bytes free)
Switch#
```

Step 3 Set boot variable

a) **boot system flash:packages.conf**

Use this command to set the boot variable to **flash:packages.conf**.

```
Switch(config)# boot system flash:packages.conf
Switch(config)# exit
```

b) **write memory**

Use this command to save boot settings.

```
Switch# write memory
```

c) **show boot system**

Use this command to verify the boot variable is set to **flash:packages.conf**.

The output should display **BOOT variable** = **flash:packages.conf**.

```
Switch# show boot system
```

Step 4 Software install image to flash

a) **request platform software package install**

Use this command to install the target image to flash.

We recommend copying the image to a TFTP server or the flash drive of the active switch. If you point to an image on the flash or USB drive of a member switch (instead of the active), you must specify the exact flash or USB drive - otherwise installation fails. For example, if the image is on the flash drive of member switch 3, the corresponding flash drive is flash-3: `Switch# request platform software package install switch all file flash-3:cat3k_caa-universalk9.16.10.01.SPA.bin new auto-copy`

Use the **switch all** option to upgrade or downgrade all the switches in your stack. Use the **auto-copy** option to copy the .bin image from flash: to all other switches in your stack

Note
Old files listed in the logs will not be removed from flash.

```
Switch# request platform software package install switch all file
flash:cat3k_caa-universalk9.16.10.01.SPA.bin auto-copy

Expanding image file: flash:cat3k_caa-universalk9.16.10.01.SPA.bin
[1]: Copying flash:cat3k_caa-universalk9.16.10.01.SPA.bin from switch 1 to switch 2 3 4
[2 3 4]: Finished copying to switch 2 3 4
[1 2 3 4]: Expanding file
[1 2 3 4]: Finished expanding all-in-one software package in switch 1 2 3 4
SUCCESS: Finished expanding all-in-one software package.
[1 2 3 4]: Performing install
SUCCESS: install Finished
[1]: install package(s) on switch 1
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-rpbase.16.10.01.SPA.pkg
Added cat3k_caa-rpcore.16.10.01.SPA.pkg
Added cat3k_caa-srdriver.16.10.01.SPA.pkg
Added cat3k_caa-guestshell.16.10.01.SPA.pkg
Added cat3k_caa-webui.16.10.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[1]: Finished install successful on switch 1
[2]: install package(s) on switch 2
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-rpbase.16.10.01.SPA.pkg
Added cat3k_caa-rpcore.16.10.01.SPA.pkg
Added cat3k_caa-srdriver.16.10.01.SPA.pkg
Added cat3k_caa-guestshell.16.10.01.SPA.pkg
```

```
Added cat3k_caa-webui.16.10.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[2]: Finished install successful on switch 2
[3]: install package(s) on switch 3
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-rpbase.16.10.01.SPA.pkg
Added cat3k_caa-rpcore.16.10.01.SPA.pkg
Added cat3k_caa-srdriver.16.10.01.SPA.pkg
Added cat3k_caa-guestshell.16.10.01.SPA.pkg
Added cat3k_caa-webui.16.10.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[3]: Finished install successful on switch 3
[4]: install package(s) on switch 4
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-rpbase.16.10.01.SPA.pkg
Added cat3k_caa-rpcore.16.10.01.SPA.pkg
Added cat3k_caa-srdriver.16.10.01.SPA.pkg
Added cat3k_caa-guestshell.16.10.01.SPA.pkg
Added cat3k_caa-webui.16.10.01.SPA.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[4]: Finished install successful on switch 4
Checking status of install on [1 2 3 4]
[1 2 3 4]: Finished install in switch 1 2 3 4
SUCCESS: Finished install: Success on [1 2 3 4]
Switch#
```

b) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash. After you have successfully installed the software, verify that the flash partition has five new .pkg files and one updated packages.conf file. See sample output below:

```
Switch# dir flash:*.pkg
Directory of flash:/*.pkg

Directory of flash:/

7761 -rw- 21906269  Mar 1 2018 04:45:48 +00:00 cat3k_caa-rpbase.16.09.01.SPA.pkg
7765 -rw- 253160056 Mar 1 2018 04:45:50 +00:00 cat3k_caa-rpcore.16.09.01.SPA.pkg
7763 -rw- 7328384   Mar 1 2018 04:45:49 +00:00 cat3k_caa-srdriver.16.09.01.SPA.pkg
7762 -rw- 165657204 Mar 1 2018 04:45:49 +00:00 cat3k_caa-guestshell.16.09.01.SPA.pkg
7764 -rw- 17408636  Mar 1 2018 04:45:49 +00:00 cat3k_caa-webui.16.09.01.SPA.pkg
7749 -rw- 21902119  Jul 10 2018 06:09:38 +00:00 cat3k_caa-rpbase.16.10.01.SPA.pkg
7760 -rw- 253094520 Jul 10 2018 06:09:41 +00:00 cat3k_caa-rpcore.16.10.01.SPA.pkg
7755 -rw- 7326336   Jul 10 2018 06:09:39 +00:00 cat3k_caa-srdriver.16.10.01.SPA.pkg
7750 -rw- 165667444 Jul 10 2018 06:09:39 +00:00 cat3k_caa-guestshell.16.10.01.SPA.pkg
```

```
7759 -rw- 16829052  Jul 10 2018 06:09:39 +00:00 cat3k_caa-webui.16.10.01.SPA.pkg
1621966848 bytes total (137928704 bytes free)
Switch#


Switch# dir flash:*.conf
Directory of flash:/*.conf

Directory of flash:/

7766 -rw- 5137 Jul 10 2018 06:10:39 +00:00 cat3k_caa-universalk9.16.10.01.SPA.conf
7769 -rw- 5125 Jul 10 2018 06:11:19 +00:00 packages.conf
1621966848 bytes total (137928704 bytes free)
Switch#
```

Step 5 Reload

a) **reload**

Use this command in the privileged EXEC mode to reload the switch.

```
Switch# reload
```

b) **boot flash:**

If the switch is configured with auto boot, then the stack automatically boots up with the new image. If not, you can manually boot flash:packages.conf

Note
When you boot the new image, the boot loader is automatically upgraded.

```
switch: boot flash:packages.conf
```

c) **show version**

Use this command to verify the version of the new image.

```
Switch# show version
Cisco IOS XE Software, Version 16.10.01
Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M), Version
 16.10.1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Tur 10-Jul-18 06:37 by mcpre
```

Downgrading to Cisco IOS XE 3.x.xE in Install Mode

Follow these instructions to downgrade to older Cisco IOS XE Release 3.x.xE releases in install mode.

Before you begin

Note that you can use this procedure for the following downgrade scenarios:

When downgrading from ...	To...
Cisco IOS XE Fuji 16.x.x or Cisco IOS XE Everest 16.x.x or Cisco IOS XE Denali 16.x.x	Cisco IOS XE Release 3.x.xE

The sample output shows downgrade from Cisco IOS XE Fuji 16.9.1 to Cisco IOS XE Release 3.7.2E.

Procedure

Step 1 Clean Up

a) **request platform software package clean**

Use this command to clean up old installation files; this ensures that you have sufficient space in the flash drive, to expand a new image. Use the **switch all** option to clean up all switches in your stack.

```
Switch# request platform software package clean switch all file flash:
Running command on switch 1
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.
Running command on switch 2
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.

Running command on switch 3
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
```

```
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.

Running command on switch 4
Cleaning up unnecessary package files
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat3k_caa-rpbase.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-rpcore.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-srdriver.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-guestshell.16.09.01.SPA.pkg
File is in use, will not delete.
cat3k_caa-webui.16.09.01.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.
The following files will be deleted:
[1]:
/flash/cat3k_caa-rpbase.16.02.01.SPA.pkg
/flash/cat3k_caa-srdriver.16.02.01.SPA.pkg
/flash/cat3k_caa-universalk9.16.01.01.SPA.bin
/flash/cat3k_caa-universalk9.16.01.01.SPA.conf
/flash/cat3k_caa-wcm.16.02.01.SPA.pkg
/flash/cat3k_caa-webui.16.02.01.SPA.pkg
/flash/packages.conf.00-
[2]:
/flash/cat3k_caa-rpbase.16.02.01.SPA.pkg
/flash/cat3k_caa-srdriver.16.02.01.SPA.pkg
/flash/cat3k_caa-universalk9.16.01.01.SPA.bin
/flash/cat3k_caa-universalk9.16.01.01.SPA.conf
/flash/cat3k_caa-wcm.16.02.01.SPA.pkg
/flash/cat3k_caa-webui.16.02.01.SPA.pkg
/flash/packages.conf.00-
[3]:
/flash/cat3k_caa-rpbase.16.02.01.SPA.pkg
/flash/cat3k_caa-srdriver.16.02.01.SPA.pkg
/flash/cat3k_caa-universalk9.16.01.01.SPA.bin
/flash/cat3k_caa-universalk9.16.01.01.SPA.conf
/flash/cat3k_caa-wcm.16.02.01.SPA.pkg
/flash/cat3k_caa-webui.16.02.01.SPA.pkg
/flash/packages.conf.00-
[4]:
/flash/cat3k_caa-rpbase.16.02.01.SPA.pkg
/flash/cat3k_caa-srdriver.16.02.01.SPA.pkg
/flash/cat3k_caa-universalk9.16.01.01.SPA.bin
/flash/cat3k_caa-universalk9.16.01.01.SPA.conf
/flash/cat3k_caa-wcm.16.02.01.SPA.pkg
/flash/cat3k_caa-webui.16.02.01.SPA.pkg
/flash/packages.conf.00-

Do you want to proceed? [y/n]y
```

```
[1]:
Deleting file flash:cat3k_caa-rpbase.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-srdriver.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.conf ... done.
Deleting file flash:cat3k_caa-wcm.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-webui.16.02.01.SPA.pkg ... done.
Deleting file flash:packages.conf.00- ... done.
SUCCESS: Files deleted.
[2]:
Deleting file flash:cat3k_caa-rpbase.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-srdriver.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.conf ... done.
Deleting file flash:cat3k_caa-wcm.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-webui.16.02.01.SPA.pkg ... done.
Deleting file flash:packages.conf.00- ... done.
SUCCESS: Files deleted.
[3]:
Deleting file flash:cat3k_caa-rpbase.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-srdriver.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.conf ... done.
Deleting file flash:cat3k_caa-wcm.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-webui.16.02.01.SPA.pkg ... done.
Deleting file flash:packages.conf.00- ... done.
SUCCESS: Files deleted.
[4]:
Deleting file flash:cat3k_caa-rpbase.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-srdriver.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.bin ... done.
Deleting file flash:cat3k_caa-universalk9.16.01.01.SPA.conf ... done.
Deleting file flash:cat3k_caa-wcm.16.02.01.SPA.pkg ... done.
Deleting file flash:cat3k_caa-webui.16.02.01.SPA.pkg ... done.
Deleting file flash:packages.conf.00- ... done.
SUCCESS: Files deleted.
Switch#
```

Step 2 Copy new image to stack

Copy the target Cisco IOS XE 3.x.xE image to flash: (you can skip this step if you want to use the image from your TFTP server).

a) **copy tftp: flash:**

Use this command to copy the image from your tftp server to flash.

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin flash:
cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
Destination filename [cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin...
Loading cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!O!!!!!!!!!!
!!!!!!!!!!!!!!!
[OK - 311154824 bytes]

311154824 bytes copied in 68.781 secs (4523849 bytes/sec)
Switch#
```

b) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash.

```
Switch# dir flash:*.bin
Directory of flash:/*.bin

Directory of flash:/

47718 -rw- 311154824 Jul 10 2018 18:17:21 +00:00
cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin

3458338816 bytes total (2468995072 bytes free)
Switch#
```

Step 3 Downgrade Software Image

a) **request platform software package install**

You can point to the source image on your tftpserver or in flash if you have it copied to flash.

Use this command with the **new** option, to downgrade your stack. Use the **switch all** option to downgrade all the switches in your stack. Use the **auto-copy** option to copy the .bin image from flash: to all other switches in your stack.

```
Switch# request platform software package install switch all file flash:cat3k_caa-
universalk9.SPA.03.07.02.E.152-3.E2.bin new auto-copy

Expanding image file: flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
[4]: Copying flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin from switch 4 to
switch 1 2 3
[1 2 3]: Finished copying to switch 1 2 3
[1 2 3 4]: Expanding file
[1 2 3 4]: Finished expanding all-in-one software package in switch 1 2 3 4
SUCCESS: Finished expanding all-in-one software package.
[1 2 3 4]: Performing install
SUCCESS: install Finished
[1]: install package(s) on switch 1
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-base.SPA.03.07.02E.pkg
Added cat3k_caa-drivers.SPA.03.07.02E.pkg
Added cat3k_caa-infra.SPA.03.07.02E.pkg
Added cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
Added cat3k_caa-platform.SPA.03.07.02E.pkg
Added cat3k_caa-wcm.SPA.10.3.120.0.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[1]: Finished install successful on switch 1
[2]: install package(s) on switch 2
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-base.SPA.03.07.02E.pkg
Added cat3k_caa-drivers.SPA.03.07.02E.pkg
Added cat3k_caa-infra.SPA.03.07.02E.pkg
```

```
Added cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
Added cat3k_caa-platform.SPA.03.07.02E.pkg
Added cat3k_caa-wcm.SPA.10.3.120.0.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[2]: Finished install successful on switch 2
[3]: install package(s) on switch 3
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-base.SPA.03.07.02E.pkg
Added cat3k_caa-drivers.SPA.03.07.02E.pkg
Added cat3k_caa-infra.SPA.03.07.02E.pkg
Added cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
Added cat3k_caa-platform.SPA.03.07.02E.pkg
Added cat3k_caa-wcm.SPA.10.3.120.0.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[3]: Finished install successful on switch 3
[4]: install package(s) on switch 4
--- Starting list of software package changes ---
Old files list:
Removed cat3k_caa-rpbase.16.09.01.SPA.pkg
Removed cat3k_caa-rpcore.16.09.01.SPA.pkg
Removed cat3k_caa-srdriver.16.09.01.SPA.pkg
Removed cat3k_caa-guestshell.16.09.01.SPA.pkg
Removed cat3k_caa-webui.16.09.01.SPA.pkg
New files list:
Added cat3k_caa-base.SPA.03.07.02E.pkg
Added cat3k_caa-drivers.SPA.03.07.02E.pkg
Added cat3k_caa-infra.SPA.03.07.02E.pkg
Added cat3k_caa-iosd-universalk9.SPA.152-3.E2.pkg
Added cat3k_caa-platform.SPA.03.07.02E.pkg
Added cat3k_caa-wcm.SPA.10.3.120.0.pkg
Finished list of software package changes
SUCCESS: Software provisioned. New software will load on reboot.
[4]: Finished install successful on switch 4
Checking status of install on [1 2 3 4]
[1 2 3 4]: Finished install in switch 1 2 3 4
SUCCESS: Finished install: Success on [1 2 3 4]
```

The old files listed in the logs should be removed using the **software clean** command, after reload.

b) **delete flash:**

After you have successfully installed the image, you no longer need the .bin image. Use this command to delete the file from flash of each switch if you copied it to flash.

```
Switch# delete flash: cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
Delete filename [cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin]?
Delete flash:/ cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin? [confirm]
Switch#
```

Step 4 Reload

a) **reload**

Use this command in the privileged EXEC mode to reload the switch.

```
Switch# reload
```

b) **boot flash:**

If the switch is configured with auto boot, then the stack automatically boots up with the new image. If not, you can manually boot flash:packages.conf

Note
When you downgrade to a Cisco IOS XE 3.xE image, the boot loader does not automatically downgrade. It remains updated. The new boot loader can support booting both Cisco IOS XE Release 3.x.xE releases as well as Cisco IOS XE Denali 16.x.x, Cisco IOS XE Everest 16.x.x, and Cisco IOS XE Fuji 16.x.x releases.

```
Switch:boot flash:packages.conf
```

Downgrading to Cisco IOS XE 3.x.xE in Bundle Mode

Follow these instructions to downgrade to older Cisco IOS XE Release 3.x.xE releases in bundle mode.

Before you begin

Note that you can use this procedure for the following downgrade scenarios:

When downgrading from ...	To...
Cisco IOS XE Fuji 16.x.x or Cisco IOS XE Everest 16.x.x or Cisco IOS XE Denali 16.x.x	Cisco IOS XE Release 3.x.xE

The sample output shows downgrade from Cisco IOS XE Fuji 16.9.1 to Cisco IOS XE Release 3.7.2E.

Procedure

Step 1 Copy new image to stack

a) **show run | i tftp**

Use this command to make sure your tftp server is reachable from IOS via GigabitEthernet0/0.

```
Switch# show run | i tftp
ip tftp source-interface GigabitEthernet0/0
ip tftp blocksize 8192
Switch#
Switch# show run | i ip route vrf
ip route vrf Mgmt-vrf 5.0.0.0 255.0.0.0 5.30.0.1
Switch#
Switch# show run int GigabitEthernet0/0
Building configuration...

Current configuration : 115 bytes
```

```
!
interface GigabitEthernet0/0
vrf forwarding Mgmt-vrf
ip address 5.30.12.121 255.255.0.0
negotiation auto
end
Switch#
Switch# ping vrf Mgmt-vrf ip 5.28.11.250
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 5.28.11.250, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/2 ms
```

b) **copy tftp: flash:**

Use this command to copy the image from your tftp server to flash.

Note
If you have a stack, you must copy the image to the flash drive of each switch in the stack.

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin flash:
cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
Destination filename [cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin...
Loading cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!O!!!!!!!!!!
!!!!!!!!!!!!!!
[OK - 311154824 bytes]

311154824 bytes copied in 68.781 secs (4523849 bytes/sec)
Switch#
```

c) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash

```
Switch# dir flash:*.bin
Directory of flash:/*.bin
Directory of flash:/

47718 -rw- 311154824 Jul 10 2018 18:17:21 +00:00
cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin

3458338816 bytes total (2468995072 bytes free)
Switch#
```

Step 2 Edit the boot variable

a) **no boot system**

Use this command to clear the boot variable.

```
Switch(config)# no boot system
```

b) **boot system**

Use this command to edit the boot variable, to point to the new image.

```
Switch(config)# boot system flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
```

c) **write memory**

Use this command to save configuration changes.

```
Switch# write memory
```

d) **show boot**

Use this command to display and verify that your boot variable is pointing to the new image.

```
Switch# show boot
----------------------------
Switch 1
----------------------------
Current Boot Variables:
BOOT variable = flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin;

Boot Variables on next reload:
BOOT variable = flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin;
Allow Dev Key = yes
Manual Boot = yes
Enable Break = yes
Switch#
```

Step 3 Reload

a) **reload**

Use this command to reload the switch.

```
switch# reload
```

b) **boot flash**

If your switches are configured with auto boot, the stack will automatically boot up with the new image. If not, you can manually boot flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin

Note
When you downgrade to a Cisco IOS XE Release 3.x.xE image, the boot loader does not automatically downgrade. The new boot loader can support booting bothCisco IOS XE Release 3.x.xE as well as Cisco IOS XE Denali 16.x.x, Cisco IOS XE Everest 16.x.x and Cisco IOS XE Fuji 16.x.x releases.

```
switch:boot flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
```

c) **show version**

After the new image boots up, use this command to verify the version of the new image.

```
Switch# show version
Cisco IOS Software, IOS-XE Software, Catalyst L3 Switch Software
(CAT3K_CAA-UNIVERSALK9-M), Version 03.07.02E RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2015 by Cisco Systems, Inc.
Compiled Tue 21-Jul-15 12:51 by prod_rel_team
```

Step 4 Move from Cisco IOS XE 3.xE Bundle Mode to Install Mode

a) **software clean file flash:**

Use this command to ensure you have enough space in flash to expand a new image by cleaning up old installation files. This command will erase your Cisco IOS XE Release 3.x.xE bin image file, so ensure that you copy it to your active switch again.

```
Switch# software clean file flash:
Preparing clean operation ...
[1 2 3 4]: Cleaning up unnecessary package files
[1 2 3 4]: Preparing packages list to delete ...
[1]: Files that will be deleted:
cat3k_caa-rpbase.16.09.01.SPA.pkg
cat3k_caa-rpcore.16.09.01.SPA.pkg
cat3k_caa-srdriver.16.09.01.SPA.pkg
cat3k_caa-universalk9.16.09.01.SPA.bin
cat3k_caa-guestshell.16.09.01.SPA.pkg
cat3k_caa-webui.16.09.01.SPA.pkg
packages.conf
[2]: Files that will be deleted:
cat3k_caa-rpbase.16.09.01.SPA.pkg
cat3k_caa-rpcore.16.09.01.SPA.pkg
cat3k_caa-srdriver.16.09.01.SPA.pkg
cat3k_caa-universalk9.16.09.01.SPA.bin
cat3k_caa-guestshell.16.09.01.SPA.pkg
cat3k_caa-webui.16.09.01.SPA.pkg
packages.conf
[3]: Files that will be deleted:
cat3k_caa-rpbase.16.09.01.SPA.pkg
cat3k_caa-rpcore.16.09.01.SPA.pkg
cat3k_caa-srdriver.16.09.01.SPA.pkg
cat3k_caa-universalk9.16.09.01.SPA.bin
cat3k_caa-guestshell.16.09.01.SPA.pkg
cat3k_caa-webui.16.09.01.SPA.pkg
packages.conf
[4]: Files that will be deleted:
cat3k_caa-rpbase.16.09.01.SPA.pkg
cat3k_caa-rpcore.16.09.01.SPA.pkg
cat3k_caa-srdriver.16.09.01.SPA.pkg
cat3k_caa-universalk9.16.09.01.SPA.bin
cat3k_caa-guestshell.16.09.01.SPA.pkg
cat3k_caa-webui.16.09.01.SPA.pkg

[1 2 3 4]: Do you want to proceed with the deletion? [yes/no]: yes
[1 2 3 4]: Clean up completed
Switch#
```

b) **copy tftp: flash:**

Use this command to copy the image from your TFTP server to flash

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin flash:
cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
Destination filename [cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin...
Loading cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!O!!!!!!!!!!!
!!!!!!!!!!!!!!
[OK - 311154824 bytes]
311154824 bytes copied in 68.781 secs (4523849 bytes/sec)
Switch#
```

c) **software expand**

Use this command to expand the target image to flash and move from bundle mode to install mode. You can point to the source image on your TFTP server or in flash if you have it copied to flash.

```
Switch# software expand file flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
Preparing expand operation ...
[1]: Copying software from active switch 1 to switches 2,3,4
[1]: Finished copying software to switches 2,3,4
[1 2 3 4]: Expanding bundle flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
[1 2 3 4]: Copying package files
[1 2 3 4]: Package files copied
[1 2 3 4]: Finished expanding bundle
flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
Switch#
```

Step 5 Edit the boot variable

a) **no boot system**

Use this command to clear the boot variable.

```
Switch(config)# no boot system
```

b) **boot system**

Use this command to edit the boot variable to point to the new image.

```
Switch(config)# boot system flash:packages.conf
```

c) **write memory**

Use this command to save configuration changes.

```
Switch# write memory
```

d) **show boot**

Use this command to confirm that your boot variable is pointing to the new image

```
Switch# show boot
----------------------------
Switch 1
----------------------------
Current Boot Variables:
BOOT variable = flash:packages.conf;

Boot Variables on next reload:
BOOT variable = flash:packages.conf;
Manual Boot = yes
Enable Break = yes
Switch#
```

Step 6 Reload

a) **reload**

Use this command to reload the switch.

```
Switch# reload
```

b) **boot flash**

Use this command to manually boot flash:packages.conf, to reload the switch. If your switches are configured with auto boot, the stack will automatically boot up with the new image.

```
switch:boot flash:packages.conf
```

c) **show version**

After the new image boots up, use this command to verify the version of the new image.

```
Switch# show version
Cisco IOS Software, IOS-XE Software, Catalyst L3 Switch Software
(CAT3K_CAA-UNIVERSALK9-M), Version 03.07.02E RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2015 by Cisco Systems, Inc.
Compiled Tue 21-Jul-15 12:51 by prod_rel_team
```

d) **delete flash:**

After you have successfully installed the image, you no longer need the .bin image. Use this command to delete the file from the flash of each switch if you had copied to flash.

```
Switch# delete flash:cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin
Delete filename [cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin]?
Delete flash:/cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin? [confirm]
Switch#
```

Licensing

This section provides information about the licensing packages for features available on Cisco Catalyst 3650 Series Switches.

License Levels

The software features available on Cisco Catalyst 3650 Series Switches fall under these base or add-on license levels.

Base Licenses

- LAN Base—Provides basic Layer 2+ features, including access control lists (ACLs) and quality of service (QoS), up to 255 VLANs, support for routing protocols (Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Policy-Based Routing (PBR), Protocol Independent Multicast Stub Routing (PIM Stub Routing) with IPv4 and IPv6, and routed access with IPv4 and IPv6 (OSPF — up to 1000 routes, Multicast — up to 1000 routes).
- IP Base—Provides Layer 2+ and basic Layer 3 features (enterprise-class intelligent services). These features include access control lists (ACLs), quality of service (QoS), static routing, Enhanced Interior Gateway Routing Protocol (EIGRP) stub routing, IP multicast routing, RIP, basic IPv6 management, the OSPF Protocol (for routed access only). The license supports up to 4094 VLANs.
- IP Services—Provides a richer set of enterprise-class intelligent services and full IPv6 support. It includes all IP Base features plus full Layer 3 routing (IP unicast routing and IP multicast routing). The IP Services feature set includes protocols such as the EIGRP, OSPF Protocol. The license supports up to 4094 VLANs.

Add-On Licenses

The features available with add-on license levels provide Cisco innovations on the switch, as well as on the Cisco Digital Network Architecture Center (Cisco DNA Center).

- DNA Advantage

To find information about platform support and to know which license levels a feature is available with, use Cisco Feature Navigator. To access Cisco Feature Navigator, go to https://cfnng.cisco.com. An account on cisco.com is not required.

License Types

The following license types are available:

- Permanent—for a license level, and without an expiration date.
- Evaluation—a license that is not registered.

License Levels - Usage Guidelines

- A permanent license can be moved from one device to another.
- A switch stack cannot contain mixed license levels. Also, the switches must be of the same platform.
- Evaluation licenses cannot be ordered. They are not tracked via Cisco Smart Software Manager and expire after a 90-day period. Evaluation licenses can be used only once on the switch and cannot be regenerated. Warning system messages about an evaluation license expiry are generated only 275 days after expiration and every week thereafter. An expired evaluation license cannot be reactivated after reload.

Cisco Smart Licensing

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure – you control what users can access. With Smart Licensing you get:

- Easy Activation: Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (Product Activation Keys).
- Unified Management: Cisco License Central provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- License Flexibility: Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

To use Smart Licensing, you must first set up a Smart Account on Cisco License Central. For a more detailed overview on Cisco Licensing, visit the Licensing Hub.



Important Cisco Smart Licensing is the default and the only available method to manage licenses.

Deploying Smart Licensing

Procedure

Step 1 Begin by establishing a connection from your network to Cisco Smart Software Manager on cisco.com.

Step 2 Create and activate your Smart Account, or login if you already have one.

To create and activate Smart Account, go to Cisco Software Central → Create Smart Accounts. Only authorized users can activate the Smart Account.

Step 3 Complete the Cisco Smart Software Manager set up.

a) Accept the Smart Software Licensing Agreement.

b) Set up the required number of Virtual Accounts, users and access rights for the virtual account users.

Virtual accounts help you organize licenses by business unit, product type, IT group, and so on.

What to do next

Register and convert traditional licenses to Smart Licenses

Converting Traditional Licenses to Smart Licenses

For Cisco Catalyst 3650 Series Switches, after you have upgraded the software image and deployed Smart Licensing, all traditional licenses on the device must be migrated, to Cisco Smart Software Manager. This is a one-time migration process that you must complete on each device.

Procedure

Step 1 Register the device

Generate the registration token in the Cisco Smart Software Manager portal and register your device with the token. In the software configuration guide of the required release, see *System Management → Configuring Smart Licensing → Registering a Device in CSSM*.

Step 2 Migrate base licenses

The system converts traditional licenses to smart licenses and sends migration data to Cisco Smart Software Manager, which in turn Cisco Smart Software Manager creates license entitlements and deposits them in your user account. In the software configuration guide of the required release, see *System Management → Configuring Smart Licensing → Migrating a License with License Conversion*..

With this

- The device is now in an authorized state and ready to use.
- The licenses that you have purchased are displayed in your Smart Account.

How Upgrading or Downgrading Software Affects Smart Licensing

Starting from Cisco IOS XE Fuji 16.9.1, Smart Licensing is the default and only license management solution; all licenses are managed as Smart Licenses.

Important Starting from Cisco IOS XE Fuji 16.9.1, the Right-To-Use (RTU) licensing mode is deprecated, and the associated **license right-to-use** command is no longer available on the CLI.

Note how upgrading to a release that supports Smart Licensing or moving to a release that does not support Smart Licensing affects licenses on a device:

- **When you upgrade from an earlier release to one that supports Smart Licensing**—all existing licenses remain in evaluation mode until registered in Cisco Smart Software Manager and then converted. After conversion, they are made available in your Smart Account.

  In the software configuration guide of the required release, see *System Management → Configuring Smart Licensing → Registering a Device in CSSM*.

- **When you downgrade to a release where Smart Licensing is not supported**—all smart licenses on the device are converted to traditional licenses and all smart licensing information on the device is removed.

Using Smart Licensing on an Out-of-the-Box Device

Limitations and Restrictions

- Cisco TrustSec restrictions:
  - Cisco TrustSec can be configured only on physical interfaces, not on logical interfaces.
  - Cisco TrustSec cannot be configured on a pure bridging domain with the IPSG feature enabled. You must either enable IP routing or disable the IPSG feature in the bridging domain.
- Control Plane Policing (CoPP)—The show run command does not display information about classes configured under system-cpp policy, when they are left at default values. Use the show policy-map system-cpp-policy or the show policy-map control-plane commands in privileged EXEC mode instead.
- DHCP Client—Starting with Cisco IOS XE Denali 16.1.x, a DHCP client that includes option 61 (used by DHCP clients to specify their unique client identifier) in their DHCP discover/offer packet must accept the response message with option 61 from the DHCP server/relay. A client that fails to accept the response message with option 61, is not in compliance with RFC 6842 and requires a firmware upgrade.
- Centralized Management Mode (CMM)—Starting with Cisco IOS XE Denali 16.3.1, CMM is not supported.
- Flexible NetFlow—You cannot configure NetFlow export using the Ethernet Management port (GigabitEthernet0/0).
- Flex Links are not supported. We recommend that you use spanning tree protocol (STP) as the alternative.
- QoS restrictions:

- When configuring QoS queuing policy, the sum of the queuing buffer should not exceed 100%.
- For QoS policies, only switched virtual interfaces (SVI) are supported for logical interfaces.
- QoS policies are not supported for port-channel interfaces, tunnel interfaces, and other logical interfaces.

- Secure Shell (SSH)
  - Use SSH Version 2. SSH Version 1 is not supported.
  - When the device is running SCP and SSH cryptographic operations, expect high CPU until the SCP read process is completed. SCP supports file transfers between hosts on a network and uses SSH for the transfer.

    Since SCP and SSH operations are currently not supported on the hardware crypto engine, running encryption and decryption process in software causes high CPU. The SCP and SSH processes can show as much as 40 or 50 percent CPU usage, but they do not cause the device to shutdown.

- Mixed stacking—A switch stack containing a mix of Cisco Catalyst 3650 Series Switches and Cisco Catalyst 3850 Series Switches is not supported.
- VLAN Restriction—It is advisable to have well-defined segregation while defining data and voice domain during switch configuration and to maintain a data VLAN different from voice VLAN across the switch stack. If the same VLAN is configured for data and voice domains on an interface, the resulting high CPU utilization might affect the device.
- YANG data modeling limitation—A maximum of 20 simultaneous NETCONF sessions are supported.
- The File System Check (fsck) utility is not supported in install mode.
- Switch Web UI allows configuration of data VLANs only and not voice VLANs. If you remove a voice VLAN configured to an interface using the Web UI, then all data VLANs associated with the interface are also removed by default.

Scaling Guidelines

System Feature	Maximum Limit
Number of HTTP session redirections system-wide	Up to 100 clients per second
Number of HTTPS session redirections system-wide	Up to 20 clients per second

Caveats

Caveats describe unexpected behavior in Cisco IOS-XE releases. Caveats listed as open in a prior release are carried forward to the next release as either open or resolved.

Cisco Bug Search Tool

The Cisco Bug Search Tool (BST) allows partners and customers to search for software bugs based on product, release, and keyword, and aggregates key data such as bug details, product, and version. The BST is designed to improve the effectiveness in network risk management and device troubleshooting. The tool has a provision to filter bugs based on credentials to provide external and internal bug views for the search input.

To view the details of a caveat, click on the identifier.

Open Caveats in Cisco IOS XE Fuji 16.9.x

Identifier	Description
CSCvn55969	FED crash when 'show tech nbar' is run
CSCvr90465	MACSEC link does not recover upon link flap
CSCvs15759	DHCP server sends out a NAK packet during DHCP renewal process.

Resolved Caveats in Cisco IOS XE Fuji 16.9.8

Caveat ID Number	Description
CSCvt53563	Cisco IOS XE Software NETCONF and RESTCONF Authentication Bypass Vulnerability
CSCvt88722	Keep auto-neg enabled even with hard code speed and duplex causing auto-neg mismatch
CSCvu90882	Romvar: Bootloop if SWITCH_DISABLE_PASSWORD_RECOVERY and SWITCH_IGNORE_STARTUP_CFG are both set to 1
CSCvv12527	Crash in SNMP Engine process while polling chassis id in lldp
CSCvw46194	IOS and IOS XE Software UDLD Denial of Service Vulnerability
CSCvx08994	CTS credential password will be added to local keystore even if the password is longer than 24 char
CSCvx34341	Netfilter: Linux Kernel triggers crash by race condition through delete operation
CSCvx41294	High CPU usage caused by "TCP Timer" process
CSCvx55976	Switch stack crash with FIPS mode enabled
CSCvx66699	Cisco IOS and IOS XE Software TrustSec CLI Parser Denial of Service Vulnerability
CSCvy17757	A crash due to issue with internal QOS policy specfic to EPC

Resolved Caveats in Cisco IOS XE Fuji 16.9.7

Caveat ID Number	Description
CSCvn22162	Cat3k crash from corruption in AVL tree
CSCvu35094	Switch reloads due to fed crash after sending multicast data packets in pvlan

Resolved Caveats in Cisco IOS XE Fuji 16.9.6

Caveat ID Number	Description
CSCvn98703	FED_QOS_ERRMSG-3-POLICER_HW_ERROR on Catalysts switches running 16.6 releases
CSCvr37805	Cat3k/9k: Device might reboot after applying "mac address-static xxxx.xxxx.xxxx vlan x drop" command
CSCvs50391	FED crash when premature free of SG element
CSCvs71519	Switch reloads due to dhcp snooping
CSCvs75010	Traffic forwarding stops when Session Idle time out is configured 10 sec with active traffic running
CSCvt02962	Uplink Port-channel Trunk member link Port LED truns to amber blinking after link down/up
CSCvt13518	QoS ACL matching incorrectly when udp range is used
CSCvu15007	Crash when invalid input interrupts a role-based access-list policy installation
CSCvu37176	SPAN filter cannot work well when configure FSPAN after 5th session.
CSCvu64977	Intermittent Link Flaps on mGig Cat3850/3650 switches to mGig capable endpoints
CSCvu87899	Crash in FED Process on Catalyst 3650/3850 Switch with a 88E1680M PHY

Resolved Caveats in Cisco IOS XE Fuji 16.9.5

Identifier	Description
CSCvk47894	Cat3k/9k SPAN monitor session works in stack only on adding 2 dest ports in stack
CSCvm72574	16.6.4 CPP Police rate wrong in "class system-cpp-police-control-low-priority"
CSCvo56403	Standby Switch Stuck in HA Sync config after Stack-Merge
CSCvo81311	FMAN-RP crash observed on Guest Anchor
CSCvp66089	3650 interface hung after reboot the device
CSCvp84502	ERSPAN destination does not work or forward traffic

Identifier	Description
CSCvq05337	Cat3k/9k EGR_INVALID_REWRITE counter increasing in mVPN setup
CSCvq22011	IOS-XE drops ARP reply when IPDT gleans from ARP
CSCvq38901	Enable CDP - removed on shut/ no shut dot1Q-tunnel interface
CSCvq44397	Cat3k/9k Ospf down upon switchover with aggressive timers "hello-interval 1" and "dead-interval 4"
CSCvq50846	ip verify source mac-check prevents device tracking from getting arp probe reply
CSCvq55940	%BIT-4-OUTOFRANGE: bit 4095 is not in the expected range of 1 to 4093
CSCvq66802	igmp query with src ip 0.0.0.0 is not ignored
CSCvq68337	Cat3k/9k does not forward packet when active route down
CSCvq72472	Private-vlan mapping XXX configuration under SVI is lost from run config after switch reload
CSCvq72713	Cat3k/Cat9k can't forwarding traffic follow the rule of EIGRP unequal cost load-balancing
CSCvq75887	intermediate hop with SVI in PIM domain is not forwarding multicast traffic
CSCvq84448	Cat3k: cef per-destination load sharing algorithm doesn't balance the flow according to the hash
CSCvq94738	The COPP configuration back to the default After rebooting the device
CSCvq98312	PSU shown as Disabled when there is not input power cables
CSCvr03905	Memory Leak on FED due to IPv6 Source Guard
CSCvr04551	Multicast stream flickers on igmp join/leave
CSCvr20522	Cat3k/9k BOOTREPLY dropped when DHCP snooping is enabled
CSCvr23358	Switches are adding Device SGT to proxy generated IGMP leave messages while keeping End host src IP
CSCvr30559	Switch may experience a kernel panic due to invalid skb
CSCvr32460	Cat3k/9k stack breaks and subsequent merge fails
CSCvr41906	Imax error on adjacent interfaces in port-group
CSCvr46931	ports remain down/down object-manager (fed-ots-mo thread is stuck)
CSCvr48249	High memory utilization under fman_fp_image
CSCvr59959	Cat3k/9k Flow-based SPAN(FSPAN) can only work in one direction when mutilple session configured

Identifier	Description
CSCvr98281	After valid ip conflict, SVI admin down responds to GARP
CSCvs14374	16.9.2 ES standby crashed
CSCvs50868	Fed memory leak in 16.9.X related to netflow

Resolved Caveats in Cisco IOS XE Fuji 16.9.4

Caveat ID Number	Description
CSCvj15473	Linux IOSD crash with sh vtp counters cmd
CSCvj16691	port LED may turn to amber
CSCvj28615	Enhancement to change pethMainPowerUsageOnNotification default threshold from 0
CSCvj84601	Called-Station-Id attribute not included in Radius Access-Request
CSCvm80443	IOSd memory leak within DSMIB Server within xqos_malloc_wrapper
CSCvm91107	standby reloads and crashed @fnf_ios_config_dist_validate_sel_process_add
CSCvm91642	MACsec SAP 128 Bits doesn't work with network-essentials license
CSCvn30230	Catalyst 3k/9k: Slow memory leak in linux_iosd-imag
CSCvn57892	High Memory utilization due to Wireless Manager IOSD process
CSCvn66396	MACSEC Portchannel member interface stays permanently down after link flap
CSCvn69629	ND packets received in remote vtep SISF table - EVPN part
CSCvn81334	Default ACL being enforced even dACL is applied after Reload
CSCvn99482	IPv6 traffic is stopped on interface when more than 3 invalid ARPs are detected
CSCvn99621	hw-switch logging onboard message may be disappeared after reload
CSCvo05751	Changes for sending vlan attrs in access request
CSCvo21122	Memory leak at hman process
CSCvo27371	Memory leak in MACSec seen during SAP scale longevity
CSCvo34804	3850 stack SFP cannot be recognized on some port and the port link also do not up
CSCvo42353	SDA-Cat9k-External border creating incorrect CEF/map-cache entry due to multicast
CSCvo46822	Packet loops are noticed when WCCP redirect out is enabled on VLAN interface of 3850 switch

Caveat ID Number	Description
CSCvo49876	SISF not honoring 1 IPv4-to-MAC rule when DHCP ACK comes from a different VLAN (via Relay)
CSCvo57768	NetFlow issue 3850 switch not sending TCP flags
CSCvo60400	errdisable detect cause bpduguard shutdown vlan continues to forward BPDUs
CSCvo61570	spanning-tree uplinkfast max-update-rate's value is abnormal
CSCvo65974	QinQ tunnels causing L2 loop in specific topology of Cat3850
CSCvo66246	Enabling SPAN source of VLAN 1 affects LACP operations
CSCvo71264	Cat3k / Cat9k Gateway routes DHCP offer incorrectly after DHCP snooping
CSCvo73205	Identity policy won't update after config changes.
CSCvo73897	[SDA] [PI changes] No audio during first few seconds of voice call between 2 Fabric Edge
CSCvo74750	High Temperature returned for Catalyst switches when the inlet temperature is negative
CSCvo75559	Cat9300 | First packet not forwarded when (S,G) needs to be built
CSCvo78538	Counters in the "show interface" command are not increasing
CSCvo85183	Cat3650 Uplinkfast take time when recovery from link failure
CSCvo85422	Directly connected IPv4/IPv6 hosts not programmed in HW - %FMFP-3-OBJ_DWNLD_TO_DP_FAILED
CSCvp00026	[SDA] [PD changes] No audio during first few seconds of voice call between 2 Fabric Edge
CSCvp03816	ENH Hex dump constantly logging when registering access point using DNAC
CSCvp09091	When sourcing Radius from loopback in VRF, auth right out of boot up might fail
CSCvp12187	Standby switch crash due to memory leak due to Switch Integrated Security feature
CSCvp13114	Cat9400 incoming packet from PVLAN access port is not forwarded out on etherchannel interface
CSCvp26792	Cat9k control plane impacted when > 1Gbps multicast passes through and no entry in IGMP snooping
CSCvp30239	memory leak when there are constant changes in REP ring
CSCvp30629	Cat9300: Lisp site entry count mismatch in external dual border on reload
CSCvp43131	Cat3650 Mgmt port "speed 1000" and "negotiation auto" in show run
CSCvp49518	DHCP SNOOPING DATABASE IS NOT REFRESHED AFTER RELOAD

Caveat ID Number	Description
CSCvp54779	[SDA] 1st ARP Reply is dropped at remote Fabric Edge
CSCvp70717	3650 Power supply status is displayed incorrectly
CSCvp72220	crash at sisf_show_counters after entering show device-tracking counters command
CSCvp75221	Modules shows faulty status when specific MAC ACL is applied on interfaces
CSCvp81190	%FED_QOS_ERRMSG-3-TABLEMAP_INGRESS_HW_ERROR was generated after setting policy-map with table-map
CSCvp85601	STP TCN is generated on etherchannel port during a switchover in a 3850 stack
CSCvp86983	Connectivity over AC tunnel broken due to tunnel deletion from FMAN FP but remains FMAN FP
CSCvp88369	Cat3k crash while accessing OBFL
CSCvp89755	VPN label is wrongly derived as explicit-null in Cat9k for L3 VPN traffic
CSCvp90279	Catalyst switches is sending ADV and REP DHCPv6 packets to SISF when source udp port is not 547
CSCvq01185	%SNMP-3-RESPONSE_DELAYED: and timeout when polling entSensorValueEntry on 16.9.3
CSCvq17759	DACL not properly enforced when pre auth acl present for some phone
CSCvq25360	PD's not getting PoE on multiple interfaces in 3850 stack
CSCvq28046	Crash at ip_source_binding_config command
CSCvq30316	[SDA] 1st ARP fix for CSCvp00026 is eventually failing after longevity
CSCvq30460	SYS-2-BADSHARE: Bad refcount in datagram_done - messages seen during system churn
CSCvq40137	Mac address not being learnt when "auth port-control auto" command is present

Resolved Caveats in Cisco IOS XE Fuji 16.9.3a

Identifier	Description
CSCvn30230	Catalyst 3k/9k: Slow memory leak in linux_iosd-imag
CSCvo44552	Show Stack-power budget missing some switches when change to standalone mode
CSCvp58138	CAT3K: Unable to retrive SUDI certificates in 16.9.3

Resolved Caveats in Cisco IOS XE Fuji 16.9.3

Identifier	Description
CSCuw36080	SNMP with Extended ACL
CSCvd72166	Uneven available power distribution when using power sharing
CSCvi48988	SNMP timeout when querying entSensorValueEntry
CSCvj79694	sgt-map gets cleared for some of the end points for unknown reason
CSCvk45142	Crash with smd fault on rp_0_0
CSCvk48653	3650 "show macsec interface" hang and intermittent traffic loss.
CSCvm07353	Router may crash when a SSH session is closed after configure TACACS
CSCvm47335	IOSd: large amount of bursty IPC traffic sometime can cause high CPU utilization in fastpath
CSCvm91340	C3650 link down with speed 100/full duplex after device reboot up
CSCvm94788	Device reloads when applying #client <IP> vrf Mgmt-vrf server-key 062B0C09586D590B5656390E15
CSCvn02171	HOLE is not created when acl default passthrough configured
CSCvn31653	Missing/incorrect FED entries for IGMP Snooping on Cat9300/Cat3850/Cat3650
CSCvn36494	WCCP redirection to proxy server breaks in certain scenarios.
CSCvn38590	CTS policies download fails with Missing/Incomplete ACEs error
CSCvn38933	C3650 LINEPROTO DOWN/UP one time when shut/no shut the no relationship port
CSCvn40414	PSU shown as Disabled when there is not input power cables.
CSCvn46334	show inventory does not list the Stack Ports / Stack cables after reload
CSCvn58515	Ac Tunnel in "pending-issue-update" state in FMAN FP
CSCvn72973	Device is getting crashed on the "cts role-based enforcement"
CSCvn96821	Stack adapter authentication failed
CSCvo00968	Radius attr 32 NAS-IDENTIFIIER not sending the FQDN
CSCvo17778	Cat9k not updating checksum after DSCP change
CSCvo19978	3650/3850 40G fixed uplink 16.9.x // Certain ports not sending control-plane traffic
CSCvo32446	High CPU Due To Looped Packet and/or Unicast DHCP ACK Dropped
CSCvo33983	Mcast traffic loss seen looks due to missing fed entries during IGMP/MLD snooping.

Resolved Caveats in Cisco IOS XE Fuji 16.9.2

Identifier	Description
CSCvg81784	Converting a layer 2 port-channel to L3 causes some Protocols to break
CSCvj16271	Addressing memory leaks in IPC error handling cases in LED, RPS, VMARGIN, USB, THERMAL
CSCvj31854	REP Node reload causes unicast traffic drops on a neighbor switch
CSCvj66609	DHCP offer received from SVI sent back to the same SVI when DHCP Snooping is enabled
CSCvj75719	System returning incorrect portchannel MIB value (IEEE8023-LAG-MIB)
CSCvj76259	MOSFET fault 3850/3650 suddenly stops providing PoE on certain ports
CSCvk03823	WS-C3650-48FQM and WS-C3650-24PD Getting Noisy after few weeks of up time
CSCvk16813	DHCP client traffic dropped with DHCP snooping and port-channel or cross stack uplinks.
CSCvk47653	Stack member crash during LACP port aggregation
CSCvk53444	Packets with Fragment Offset not forwarded with DHCP Snooping Enabled
CSCvm36748	FED crash at expired "FED MAC AGING TIMER" or "unknown" timer without a stack trace.

Resolved Caveats in Cisco IOS XE Fuji 16.9.1

Identifier	Description
CSCvg53159	%SNMP-3-RESPONSE_DELAYED: processing GetNext of cafSessionEntry.2 seen on catalyst switch
CSCvg67012	Deprecate the option of member flash# in upgrade/downgrade CLI for software install
CSCvg77396	Port went to err-disable due to link-flap detected after shutdown no shut
CSCvh28402	optical signal present on shut interface with "cts manual"
CSCvh48269	Stack member loses connection to active on single cable auth failure
CSCvh74872	3850/3650 :: incorrect OID values for IEEE8023-LAG-MIB
CSCvh84345	IOS CLI "show platform software fed switch active punt cause summary" may display negative counts
CSCvh87131	TRACEBACK: OID cefcModuleEntry crashes the box
CSCvi06186	stack logging onboard(OBFL) config disappear after switchover

Identifier	Description
CSCvi08459	set different words for username and password, but username shown the same as password
CSCvi15897	Silent Reload on Cat3850/3650 running Everest 16.6.2
CSCvi38191	Memory leak in lman process due to "ld_license_ext.dat" build-up.
CSCvi75086	Rapid TDL memory leak in SMD process leads to crash of active switch in stack for ipv6 clients

Troubleshooting

For the most up-to-date, detailed troubleshooting information, see the Cisco TAC website at this URL:

https://www.cisco.com/en/US/support/index.html

Go to **Product Support** and select your product from the list or enter the name of your product. Look under Troubleshoot and Alerts, to find information for the problem that you are experiencing.

Related Documentation

Information about Cisco IOS XE at this URL: https://www.cisco.com/c/en/us/products/ios-nx-os-software/ios-xe/index.html

All support documentation for Cisco Catalyst 3650 Series Switches is at this URL: https://www.cisco.com/go/cat3650_docs

Cisco Validated Designs documents at this URL: https://www.cisco.com/go/designzone

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: https://cfnng.cisco.com/mibs

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