

Release Notes for Cisco Catalyst 3650 Series Switches, Cisco IOS XE Everest 16.5.1a

First Published: May 31, 2017

This release note gives an overview of the features for the Cisco IOS XE Everest 16.5.1a software on Cisco Catalyst 3650 Series Switches.

Unless otherwise noted, the terms *switch* and *device* refer to a standalone switch and to a switch stack.

Note
- For information about unsupported features, see Important Notes, page 4.
- For information about software and hardware restrictions and limitations, see Limitations and Restrictions, page 46.
- For information about open issues with the software and past opens that are resolved, see Caveats, page 47.

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. The 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, Cisco IOS XE Denali 16.x.x, and now Cisco IOS XE Everest 16.x.x, represent 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.

Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Whats New in Cisco IOS XE Everest 16.5.1a

Software Features in Cisco IOS XE Everest 16.5.1a

Feature Name	Description and License Level Information
New in Wired Switching	
Audio Video Bridging (AVB): IEEE 802.1BA	Introduces support for AVB on these additional switch models: • WS-C3650-8X24UQ • WS-C3650-12X48UQ See Audio Video Bridging
Cisco TrustSec: SxPv4 in LAN Base	Introduces support for Cisco TrustSec on LAN Base licenses. See SGT Exchange Protocol over TCP (SXP) (LAN Base, IP Base, and IP Services)
Easy QoS—Match-all	QoS group-based classification supports the match-all filter in class-maps for identifying data packets. See Configuring QoS (LAN Base, IP Base, and IP Services)
Flexible Netflow (FNF)—IPv4 and IPv6 flow-monitor on the same interface	Enables you to associate multiple monitors of different traffic types, to an interface in the same direction. See Configuring Flexible NetFlow (Apply a Flow to an Interface) (IP Base and IP Services)
Multi-Gig (mGig) Ethernet: Auto-Speed Detection	mGig Ethernet supports multi-rate speeds where the ports exchange auto-negotiation pages to establish a link at the highest supported speed by both channels. See Configuring Interface Charecteristics (Multigigabit Ethernet) (LAN Base, IP Base, and IP Services)
3 VRF	Starting with this release, the 3 VRF feature is available at the IP Base license level. It was previously available only at the IP Services license level. (IP Base and IP Services)

Feature Name	Description and License Level Information
Programmability: • Preboot Execution Environment Client (iPXE) • Zero-Touch Provisioning (ZTP) • Guest Shell • Python Scripting • Data model changes	Introduces the following capabilities and enhancements for Programmability in this release: • iPXE—An open Preboot eXecution Environment (PXE) client that allows a device to boot from a network boot image. (LAN Base, IP Base, and IP Services) • ZTP—Open Zero Touch Provisioning (ZTP) interface to allow devices to be provisioned and configured automatically, eliminating most of the manual labor involved with adding them to a network. (LAN Base, IP Base, and IP Services) • Guest Shell—A secure LXC container that is an embedded Linux environment and enables you to develop and run Linux and custom Python applications for automated control and management of Cisco switches. Guest Shell is bundled with the software image (`cat3k_caa-guestshell.<release name>.SPA.pkg`)and can be installed using the **guestshell enable** command. • Python Scripting—Supports Python v2.7 in both interactive and non-interactive (script) modes and is available in the Guest Shell. The Python scripting capability gives programmatic access to YANG data models and the device's command-line interface (CLI) to perform various tasks such as Zero Touch Provisioning (ZTP) and Embedded Event Manager (EEM) actions. (LAN Base, IP Base, and IP Services) • Data model changes—Starting with this release, the Cisco IOS XE YANG models are available in the form of individual feature modules with new module names, namespaces and prefixes. Revision statements embedded in the YANG files indicate if there has been a model revision. Navigate to https://github.com/YangModels/yang > **vendor> cisco > xe > 1651** , to see the new, main **cisco-IOS-XE-native module** and individual feature modules attached to this node The *README.md* file in the above Github location highlights these and other changes.
Trust Worthy Systems (TWS): Attack Surface Reduction: Display Active TCP Ports	Introduces support for the **show ip ports all** privilege EXEC command, to display all the open ports on a device. See IP Commands (LAN Base, IP Base, and IP Services)

Feature Name	Description and License Level Information
Wired Application Visibility and Control (wired AVC) FNF	Introduces support for show commands, to view wired AVC flow monitor configuration and flow cache contents. **Note** Starting with this release, the feature is not supported on LAN Base licenses. See Application Visibility and Control in a Wired Network (IP Base and IP Services)
New on the Web User Interface	
Web UI support for Enhanced Interior Gateway Routing Protocol (EIGRP) and troubleshooting	Features introduced and updated on the Web UI in this release: • EIGRP • Troubleshooting connectivity problems and packet loss using Ping and Traceroute, and monitoring device health and performance using web server logs, syslogs and packet captures. **Note** Beginning in Cisco IOS XE Everest 16.5.1a, the Web UI does not support wireless features.

Important Notes

- 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.
- 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.
- Starting with Cisco IOS XE Denali 16.3.x, Secure Shell (SSH) Version 1 is deprecated. Use SSH Version 2 instead.
- A switch stack containing a mix of Cisco Catalyst 3650 Series Switches and Cisco Catalyst 3850 Series Switches is not supported.
- Cisco Discovery Protocol (CDP) Bypass is available in Cisco IOS XE Release 3.6.3E, but is not supported in Cisco IOS XE Everest 16.5.1a
- 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 Everest 16.5.1a.
- 256-bit AES MACsec (IEEE 802.1AE) host link encryption with MACsec Key Agreement (MKA) is available in the Cisco IOS XE Denali 16.3.x release train, starting with Cisco IOS XE Denali 16.3.1, but the feature is not supported in Cisco IOS XE Everest 16.5.1a.
- The following features are not supported in Cisco IOS XE Everest 16.5.1a:
  - 802.1x Configurable username and password for MAB
  - AAA: TACACS over IPv6 Transport
  - Auto QoS for Video endpoints

- Cisco Group Management Protocol (CGMP)
- Cisco TrustSec 802.1x
- Cisco TrustSec Critical Auth
- Cisco TrustSec for IPv6
- CNS Config Agent
- Command Switch Redundancy
- Device classifier for ASP
- DHCP snooping ASCII circuit ID
- DHCPv6 Relay Source Configuration
- DVMRP Tunneling
- Dynamic Access Ports
- EX SFP Support (GLC-EX-SMD)
- Fallback bridging for non-IP traffic
- Fast SSID support for guest access WLANs
- IEEE 802.1X-2010 with 802.1AE support
- Improvements in QoS policing rates
- Ingress Strict Priority Queuing (Expedite)
- Ingress/egress Shared Queues
- IP-in-IP (IPIP) Tunneling
- IPsec
- IPSLA Media Operation
- IPv6 IKEv2 / IPSecv3
- IPv6 Ready Logo phase II - Host
- IPv6 Static Route support on LAN Base images
- IPv6 Strict Host Mode Support
- 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 Policy & Per Port Policer
- Performance Monitor (Phase 1)
- Port Security on EtherChannel
- Pragmatic General Multicast (PGM)
- RFC 4292 IP-FORWARD-MIB (IPv6 only)
- RFC 4293 IP-MIB (IPv6 only)
- RFC4292/RFC4293 MIBs for IPv6 traffic

- RFC5460 DHCPv6 Bulk Leasequery
- Trust Boundary Configuration
- UniDirectional Link Routing (UDLR)
- VACL Logging of access denied
- VACL Logging of access denied
- VRF-Aware Web-Based Authentication
- Web-Based Authentication without SVI
- Weighted Random Early Detect (WRED)

Supported Hardware

Catalyst 3650 Switch Models

Table 1 Catalyst 3650 Switch Models

Switch Model	Cisco IOS Image	Description
WS-C3650-24TS-L	LAN Base	Stackable 24 10/100/1000 Ethernet downlink ports, 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, 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

Table 1 Catalyst 3650 Switch Models (continued)

Switch Model	Cisco IOS Image	Description
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
WS-C3650-24PDM-L	LAN 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-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-C3650-24TS-S	IP Base	Stackable 24 10/100/1000 Ethernet downlink ports, four 1-Gigabit SFP uplink ports, 250-W power supply
WS-C3650-48TS-S	IP Base	Stackable 48 10/100/1000 Ethernet downlink ports, four 1-Gigabit SFP uplink ports, 250-W power supply

Table 1 Catalyst 3650 Switch Models (continued)

Switch Model	Cisco IOS Image	Description
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
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

Table 1 Catalyst 3650 Switch Models (continued)

Switch Model	Cisco IOS Image	Description
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
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

Table 1 Catalyst 3650 Switch Models (continued)

Switch Model	Cisco IOS Image	Description
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

Catalyst switches support a wide range of optics. Because the list of supported optics is updated on a regular basis, consult the tables at this URL for the latest (SFP) compatibility information:

http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html

Compatibility Matrix

Table 2 lists the software compatibility matrix.

Table 2 Software Compatibility Matrix

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
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[2] See Prime Infrastructure 3.1 on cisco.com
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 [1]+ PI 3.1.5 update 1[1] + PI 3.1 latest device pack[2] (Wired) See Prime Infrastructure 3.1 on cisco.com. PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack[2] (Wireless) See Prime Infrastructure 3.1 on cisco.com.
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[2] (Wired and Wireless). See Prime Infrastructure 3.1 on cisco.com.
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[2] (Wired and Wireless). See Prime Infrastructure 3.1 on cisco.com.
Denali 16.2.2	03.07.02E 03.06.03E[4]	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)
Denali 16.2.1	03.07.03E 03.06.03E[4]	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[3] + Device Pack 4 + PI 3.0 Technology Pack (Wireless)

Table 2 Software Compatibility Matrix

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Denali 16.1.3	03.07.02E 03.06.03E[4]	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
Denali 16.1.2	03.07.02E 03.06.03E[4]	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
Denali 16.1.1	03.07.02E 03.06.03E[4]	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
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 8.0[5]	1.3 1.3	5.2 5.2 5.3	2.2
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 8.0 7.6	8.0 8.0	1.3 1.2	5.2 5.2 5.3	2.2 2.2, 2.1.2, or 2.1.1 if MSE is also deployed[6] 2.1.0 if MSE is not deployed
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[7]	7.5	1.2	5.2 5.3	2.0

1. For patches, go to Prime Infrastructure Patches.
2. For maintenance release patches, go to Prime Infrastructure Software. For the latest device pack, go to Prime Infrastructure Device Pack..
3. 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.
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 3850 running Cisco IOS XE Denali 16.1.1
5. 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.
6. If MSE is deployed on your network, we recommend that you upgrade to Cisco Prime Infrastructure 2.1.2.
7. Prime Infrastructure 2.0 enables you to manage Cisco WLC c7.5.102.0 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.

Web UI System Requirements

Hardware Requirements

Table 3 Minimum Hardware Requirements

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
233 MHz minimum[1]	512 MB[2]	256	1024 x 768	Small

1. We recommend 1 GHz.
2. We recommend 1 GB DRAM.

Software Requirements

- Operating Systems
  - Windows 7
  - Mac OS X 10.9.5
- Browsers
  - Google Chrome—Version 38 and later (On Windows)
  - Microsoft Internet Explorer—Versions 10 and later (On Windows)
  - Mozilla Firefox—Version 33 and later (On Windows and Mac)
  - Safari—Version 7 and later (On Mac)

Finding the Software Version and Feature Set

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.

Upgrading the Switch Software

This section covers the following scenarios:

- Automatic Boot Loader Upgrade
- Automatic Microcode Upgrade
- Upgrading from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.5.1a in Install Mode
- Upgrading from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.5.1a in Bundle Mode
- Upgrading from Cisco IOS XE Denali 16.x.x to Cisco IOS XE Everest 16.5.1a in Install Mode
- Upgrading from Cisco IOS XE Everest 16.5.1a to Cisco IOS XE 16.x.x in Install Mode
- Downgrade from Cisco IOS XE 16.x.x to Cisco IOS XE 3.xE in Install Mode
- Downgrade from Cisco IOS XE 16.x.x to Cisco IOS XE 3.xE in Bundle Mode
- Upgrading RTU Licenses

Note You cannot use the Web UI to install, upgrade to, or downgrade from Cisco IOS XE Denali 16.x.x or Cisco IOS XE Everest 16.x.x.

Table 4 Software Images

Release	Image	File Name
Cisco IOS XE Everest 16.5.1a	Universal	cat3k_caa-universalk9.16.05.01a.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.05.01a.SPA.bin

Table 5 Changes in Software Installation CLI Commands

Cisco IOS XE 3.xE	
`Switch#software ?`	
`auto-upgrade`	Initiate auto upgrade for switches running incompatible software
`clean`	Clean unused package files from local media
`commit`	Commit the provisioned software and cancel the automatic rollback timer
`expand`	Expand a software bundle to local storage, default location is where the bundle currently resides
`install`	Install software
`rollback`	Rollback the committed software
Cisco IOS XE Denali and Everest 16.x.x Commands	
`Switch#request platform software package ?`	
`clean`	Clean unnecessary package files from media
`copy`	Copy package to media
`describe`	Describe package content
`expand`	Expand all-in-one package to media
`install`	Package installation
`uninstall`	Package uninstall
`verify`	Verify ISSU software package compatibility

Automatic Boot Loader Upgrade

When you upgrade from any prior IOS 3.xE release to an IOS XE 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 an IOS 3.xE release, your boot loader will not be downgraded. The updated boot loader supports all previous IOS 3.xE releases.

For subsequent IOS XE 16.x.x releases, if there is a new bootloader in that 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 Everest 16.5.1a the first time	The boot loader may be upgraded to version 4.56. For example:
	`BOOTLDR: CAT3K_CAA Boot Loader (CAT3K_CAA-HBOOT-M) Version 4.56, RELEASE SOFTWARE (P)`
	If the automatic boot loader upgrade occurs, while booting Cisco IOS XE Everest 16.5.1a, you will see the following on the console:
	`%IOSXEBOOT-Sat-###: (rp/0): May 27 00:22:16 Universal 2017 PLEASE DO NOT POWER CYCLE ### BOOT LOADER UPGRADING 4`
	`%IOSXEBOOT-loader-boot: (rp/0): upgrade successful 4`

Automatic Microcode Upgrade

During an 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.

With the Cisco IOS XE Denali 16.x.x and the Cisco IOS XE Everest 16.x.x releases, it takes approximately an additional 4 minutes to complete the microcode upgrade in addition to the normal reload time. 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:

```
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
Image for front-end 0: /tmp/microcode_update/front_end/fe_type_6_1
Image for front-end 0: /tmp/microcode_update/front_end/fe_type_6_2
Image for front-end 0: /tmp/microcode_update/front_end/fe_type_6_3

Front-end Microcode IMG MGR: Preparing to program device microcode...
Front-end Microcode IMG MGR: Preparing to program device[0]...594412 bytes....
Skipped[0].
Front-end Microcode IMG MGR: Preparing to program device[0]...381758 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]...25166 bytes.
Front-end Microcode IMG MGR: Programming device
0...rrrrrrw..0%....10%....20%......30%...40%......50%....60%......70%...80%......90%..
..100%
Front-end Microcode IMG MGR: Microcode programming complete for device 0.
```

```
Front-end Microcode IMG MGR: Preparing to program device[0]...86370 bytes....
Skipped[3].
Front-end Microcode IMG MGR: Microcode programming complete in 237 seconds
```

Upgrading from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.5.1a in Install Mode

Follow these instructions to upgrade from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x or Cisco IOS XE Everest 16.5.1a in install mode:

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 Software Install Image to Flash, page 17.

Step 1 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
```

Step 2 Copy the image from your tftp server to flash.

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin flash:
Destination filename [cat3k_caa-universalk9.16.05.01a.SPA.binn]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin...
Loading cat3k_caa-universalk9.16.05.01a.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!
[OK - 373203016 bytes]

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

Step 3 Use the **dir flash** command to confirm that the image has been successfully copied to flash.

```
Switch# dir flash:*.bin
```

```
Directory of flash:/

32339 -rw- 373217171 May 26 2017 13:52:53 -07:00
cat3k_caa-universalk9.16.05.01a.SPA.bin

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

Software Install Image to Flash

Step 4 Use the **software install** 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-universalk9.16.03.01.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-universalk9.16.05.01a.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-universalk9.16.05.01a.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.16.05.01a.SPA.pkg
    Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
    Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
```

```
    Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
    Added cat3k_caa-webui.16.05.01a.SPA.pkg
[2]: New files list:
    Added cat3k_caa-rpbase.16.05.01a.SPA.pkg
    Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
    Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
    Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
    Added cat3k_caa-webui.16.05.01a.SPA.pkg
[3]: New files list:
    Added cat3k_caa-rpbase.16.05.01a.SPA.pkg
    Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
    Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
    Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
    Added cat3k_caa-webui.16.05.01a.SPA.pkg
[4]: New files list:
    Added cat3k_caa-rpbase.16.05.01a.SPA.pkg
    Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
    Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
    Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
    Added cat3k_caa-webui.16.05.01a.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

Reload

Step 5 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

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

Note When you boot the new image, it will automatically update the boot loader.

Step 6 When the new image boots up, you can verify the version of the new image, by checking **show version**

```
Switch# show version
Cisco IOS XE Software, Version 16.05.01a
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.5.1a, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 30-May-17 00:59 by mcpre
```

Step 7 After you have successfully installed the image, you no longer need the .bin image and the file can be deleted from flash of each switch if it was copied to flash.

```
Switch# delete flash:cat3k_caa-universalk9.16.05.01a.SPA.bin
Delete filename [cat3k_caa-universalk9.16.05.01a.SPA.bin]?
Delete flash:/cat3k_caa-universalk9.16.05.01a.SPA.bin? [confirm]
Switch#
```

Upgrading from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.5.1a in Bundle Mode

Follow these instructions to upgrade from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.5.1a in bundle mode:

Copy New Image to Stack

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

Step 1 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
```

Step 2 Copy the image from your TFTP server to flash.

```
Switch#copy tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin flash:
Destination filename [cat3k_caa-universalk9.16.05.01a.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin...
Loading cat3k_caa-universalk9.16.05.01a.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!
[OK - 373203016 bytes]

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

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

Step 3 Use the **dir flash** command to confirm that the image has been successfully copied to flash.

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

32339 -rw- 373217171 May 26 2017 13:52:53 -07:00
cat3k_caa-universalk9.16.05.01a.SPA.bin

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

Edit the Boot variable

Step 4 Clear the boot variable

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

Step 5 Edit the boot variable to point to the new image.

```
Switch(config)# boot system flash:cat3k_caa-universalk9.16.03.01.SPA.bin
```

Step 6 Use the **write memory** command to save the configuration change.

```
Switch#write memory
```

Step 7 Use the **show boot** command to confirm that your boot variable is pointing to the new image

```
Switch# show boot
--------------------------
Switch 1
--------------------------
Current Boot Variables:
BOOT variable = flash:cat3k_caa-universalk9.16.05.01a.SPA.bin;

Boot Variables on next reload:
BOOT variable = flash:cat3k_caa-universalk9.16.05.01a.SPA.bin;
Allow Dev Key = yes
Manual Boot = yes
Enable Break = yes
Switch#
```

Reload

Step 8 Reload the switch

```
Switch# reload
```

Step 9 If your switches are configured with auto boot, the stack will automatically boot up with the new image that your boot variable is configured to. If not, you can manually boot flash: cat3k_caa-universalk9.16.02.01.SPA.bin

```
switch:boot flash:cat3k_caa-universalk9.16.05.01a.SPA.bin
```

Note When you boot the new image, it will automatically update the boot loader.

Step 10 When the new image boots up, you can verify the version of the new image, by checking **show version**

```
Switch# show version
Cisco IOS XE Software, Version 16.05.01a
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.5.1a, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 30-May-17 00:59 by mcpre
```

Move from Cisco IOS XE Everest 16.x.x Bundle Mode to Install Mode

Step 11 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 Everest 16.x.x bin image file, so ensure that you copy it to your Active again.

Note 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-universalk9.16.01.01.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-universalk9.16.01.01.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-universalk9.16.01.01.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-universalk9.16.01.01.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-universalk9.16.01.01.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-universalk9.16.01.01.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-universalk9.16.01.01.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-universalk9.16.01.01.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#
```

Step 12 Copy the image from your tftp server to flash

```
Switch#copy tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin flash:
Destination filename [cat3k_caa-universalk9.16.05.01a.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin...
Loading cat3k_caa-universalk9.16.05.01a.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!
[OK - 373203016 bytes]

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

Step 13 Use the **`software expand`** 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.

Note 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-universalk9.16.05.01a.SPA.bin auto-copy
[1]: Copying flash:cat3k_caa-universalk9.16.05.01a.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#
```

Edit the Boot variable

Step 14 Clear the boot variable

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

Step 15 Edit the boot variable to point to the new image.

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

Step 16 Use the **`write memory`** command to save the configuration change.

```
Switch# write memory
```

Step 17 Use the **`show boot`** 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#
```

Reload

Step 18 Reload the switch

```
Switch# reload
```

Step 19 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

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

Step 20 When the new image boots up, you can verify the version of the new image, by checking **show version**

```
Switch# show version
Cisco IOS XE Software, Version 16.05.01a
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.5.1a, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 30-May-17 00:59 by mcpre
```

Step 21 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 you had copied to flash.

```
Switch# delete flash:cat3k_caa-universalk9.16.05.01a.SPA.bin
Delete filename [cat3k_caa-universalk9.16.05.01a.SPA.bin]?
Delete flash:/cat3k_caa-universalk9.16.05.01a.SPA.bin? [confirm]
Switch#
```

Upgrading from Cisco IOS XE Denali 16.x.x to Cisco IOS XE Everest 16.5.1a in Install Mode

Follow these instructions to upgrade from Cisco IOS XE Denali 16.x.x to Cisco IOS XE Everest 16.5.1a in install mode. In order to do a software image upgrade, you must be booted into IOS using the **boot flash:packages.conf**.

Clean Up

Step 1 Ensure you have enough space in flash to expand a new image by cleaning up old installation files.



Note 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.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-wcm.16.01.01.SPA.pkg
      File is in use, will not delete.
```

```
    cat3k_caa-webui.16.01.01.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-rpbase.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-wcm.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.01.01.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-rpbase.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-wcm.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.01.01.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-rpbase.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-wcm.16.01.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.01.01.SPA.pkg
      File is in use, will not delete.
  done.

SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Switch#
```

Copy New Image to Stack

Step 2 Copy the new image to flash: (or skip this step if you want to use the new image from your TFTP server).

```
Switch#copy tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin flash:
Destination filename [cat3k_caa-universalk9.16.05.01a.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.05.01a.SPA.bin...
Loading cat3k_caa-universalk9.16.05.01a.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!
[OK - 373203016 bytes]

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

Step 3 Use the **`dir flash`** command to confirm that the image has been successfully copied to flash.

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

32339 -rw- 373217171 May 26 2017 13:52:53 -07:00
cat3k_caa-universalk9.16.05.01a.SPA.bin

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

Software Install Image to Flash

Step 4 Use the **`request platform software package install switch all file flash: new auto-copy`** 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:

```
request platform software package install switch all file
flash-3:cat3k_caa-universalk9.16.03.05.SPA.bin new auto-copy
      <output truncated>
Expanding image file: flash-3: cat3k_caa-universalk9.16.03.05.SPA.bin
[3]: Copying flash-3: cat3k_caa-universalk9.16.03.05.SPA.bin from switch 3 to switch 1
2 4
<output truncated>
```

Note Use the **`switch all`** option to upgrade all switches in your stack
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 16.5.1a. (There are packaging changes in the different 16.x.x releases.)
Use the **`auto-copy`** option to copy the .bin image from flash: to all other switches in your stack

Note When you execute the command, the following message is displayed:

```
Unknown package type 21
```

This is expected and does not affect the upgrade. See CSCux82059

```
Switch# request platform software package install switch all file
flash:cat3k_caa-universalk9.16.05.01a.SPA.bin new auto-copy
Expanding image file: flash:cat3k_caa-universalk9.16.05.01a.SPA.bin
[1]: Copying flash:cat3k_caa-universalk9.16.05.01a.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-rpbase.16.01.01E.SPA.pkg
  Removed cat3k_caa-srdriver.16.01.01E.SPA.pkg
  Removed cat3k_caa-wcm.16.01.01E.SPA.pkg
  Removed cat3k_caa-webui.16.01.01E.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.05.01a.SPA.pkg
  Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Added cat3k_caa-webui.16.05.01a.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.16.01.01E.SPA.pkg
  Removed cat3k_caa-srdriver.16.01.01E.SPA.pkg
  Removed cat3k_caa-wcm.16.01.01E.SPA.pkg
  Removed cat3k_caa-webui.16.01.01E.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.05.01a.SPA.pkg
  Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Added cat3k_caa-webui.16.05.01a.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.16.01.01E.SPA.pkg
  Removed cat3k_caa-srdriver.16.01.01E.SPA.pkg
  Removed cat3k_caa-wcm.16.01.01E.SPA.pkg
  Removed cat3k_caa-webui.16.01.01E.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.05.01a.SPA.pkg
  Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Added cat3k_caa-webui.16.05.01a.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.16.01.01E.SPA.pkg
  Removed cat3k_caa-srdriver.16.01.01E.SPA.pkg
  Removed cat3k_caa-wcm.16.01.01E.SPA.pkg
  Removed cat3k_caa-webui.16.01.01E.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.05.01a.SPA.pkg
  Added cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Added cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Added cat3k_caa-webui.16.05.01a.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.

Step 5 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:/

 7747  -rw-   281076014  Mar 27 2016 22:15:50 +00:00
cat3k_caa-rpbase.16.01.01E.SPA.pkg
 7748  -rw-     7197312  Mar 27 2016 22:15:51 +00:00
cat3k_caa-srdriver.16.01.01E.SPA.pkg
 7749  -rw-   166767220  Mar 27 2016 22:15:51 +00:00  cat3k_caa-wcm.16.01.01E.SPA.pkg
 7750  -rw-    14631548  Mar 27 2016 22:15:51 +00:00
cat3k_caa-webui.16.01.01E.SPA.pkg
31000  -rw-         22173354   Aug 1 2016 04:40:38 -07:00
cat3k_caa-rpbase.16.05.01a.SPA.pkg
30996  -rw-        266177140   Aug 1 2016 04:40:36 -07:00
cat3k_caa-rpcore.16.05.01a.SPA.pkg
30998  -rw-          9067132   Aug 1 2016 04:40:37 -07:00
cat3k_caa-srdriver.16.05.01a.SPA.pkg
30999  -rw-        178403952   Aug 1 2016 04:40:38 -07:00
cat3k_caa-guestshell.16.05.01a.SPA.pkg
30997  -rw-         13333112   Aug 1 2016 04:40:37 -07:00
cat3k_caa-webui.16.05.01a.SPA.pkg
1621966848 bytes total (132620288 bytes free)
Switch#

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

32342 -rw- 4690 May 26 2017 14:58:12 -07:00 packages.conf

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

Step 6 After you have successfully installed the image, you no longer need the.bin image. If you copied the file to flash, you can delete it from the flash of each switch.

```
Switch# delete flash:cat3k_caa-universalk9.16.05.01a.SPA.bin
Delete filename [cat3k_caa-universalk9.16.05.01a.SPA.bin]?
Delete flash:/ cat3k_caa-universalk9.16.05.01a.SPA.bin? [confirm]
Switch#
```

Reload

Step 7 Reload the switch.

```
Switch# reload
```

Step 8 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
```

Step 9 When the new image boots up, you can verify the version of the new image, by using the **`show version`** command:

```
Switch# show version
Cisco IOS XE Software, Version 16.05.01a
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.5.1a, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 30-May-17 00:59 by mcpre
```

Upgrading from Cisco IOS XE Everest 16.5.1a to Cisco IOS XE 16.x.x in Install Mode

Follow these instructions to upgrade from Cisco IOS XE Everest 16.5.1a to a future IOS XE 16.x.x release in Install mode. In order to do a software image upgrade, you must be booted into IOS via “boot flash:packages.conf.”

Clean Up

Step 1 Ensure you have enough space in flash to expand a new image by cleaning up old installation files.



Note 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.16.05.01a.SPA.pkg
      File is in use, will not delete.
```

```
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.SPA.pkg
```

```
        File is in use, will not delete.
    done.

SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Switch#
```

Copy New Image to Stack

Step 2 Copy the new image to flash: (or skip this step if you want to use the new image from your TFTP server).

```
Switch# copy tftp://5.28.11.250/cat3k_caa-universalk9.16.06.01.SPA.bin
flash:cat3k_caa-universalk9.16.06.01.SPA.bin
Destination filename [cat3k_caa-universalk9.16.06.01.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.06.01.SPA.bin...
Loading cat3k_caa-universalk9.16.06.01.SPA.bin from 5.28.11.250 (via
GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!
[OK - 465466221 bytes]

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

Step 3 Use the **dir flash** 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  Aug 1 2016 04:35:43 +00:00
cat3k_caa-universalk9.16.06.01.SPA.bin
1621966848 bytes total (598597632 bytes free)
Switch#
```

Software Install Image to Flash

Step 4 Use the **request platform software package install switch all file flash: auto-copy** 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:

```
request platform software package install switch all file
flash-3:cat3k_caa-universalk9.16.03.05.SPA.bin new auto-copy
      <output truncated>
Expanding image file: flash-3: cat3k_caa-universalk9.16.03.05.SPA.bin
[3]: Copying flash-3: cat3k_caa-universalk9.16.03.05.SPA.bin from switch 3 to switch 1
2 4
<output truncated>
```

Note 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 install switch all file
flash:cat3k_caa-universalk9.16.06.01.SPA.bin auto-copy
Expanding image file: flash:cat3k_caa-universalk9.16.06.01.SPA.bin
[1]: Copying flash:cat3k_caa-universalk9.16.06.01.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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.06.01.SPA.pkg
  Added cat3k_caa-rpcore.16.06.01.SPA.pkg
  Added cat3k_caa-srdriver.16.06.01.SPA.pkg
  Added cat3k_caa-guestshell.16.06.01.SPA.pkg
  Added cat3k_caa-webui.16.06.01.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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.06.01.SPA.pkg
  Added cat3k_caa-rpcore.16.06.01.SPA.pkg
  Added cat3k_caa-srdriver.16.06.01.SPA.pkg
  Added cat3k_caa-guestshell.16.06.01.SPA.pkg
  Added cat3k_caa-webui.16.06.01.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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.06.01.SPA.pkg
  Added cat3k_caa-rpcore.16.06.01.SPA.pkg
  Added cat3k_caa-srdriver.16.06.01.SPA.pkg
  Added cat3k_caa-guestshell.16.06.01.SPA.pkg
  Added cat3k_caa-webui.16.06.01.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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.SPA.pkg
New files list:
  Added cat3k_caa-rpbase.16.06.01.SPA.pkg
  Added cat3k_caa-rpcore.16.06.01.SPA.pkg
  Added cat3k_caa-srdriver.16.06.01.SPA.pkg
  Added cat3k_caa-guestshell.16.06.01.SPA A.pkg
  Added cat3k_caa-webui.16.06.01.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.

Step 5 After the software has been successfully installed, verify that the flash partition has five new .pkg files and 1 updated packages.conf file. See sample output below.

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

Directory of flash:/

 7761  -rw-    21906269  Aug 1 2016 04:45:48 +00:00
cat3k_caa-rpbase.16.05.01a.SPA.pkg
 7765  -rw-   253160056  Aug 1 2016 04:45:50 +00:00
cat3k_caa-rpcore.16.05.01a.SPA.pkg
 7763  -rw-     7328384  Aug 1 2016 04:45:49 +00:00
cat3k_caa-srdriver.16.05.01a.SPA.pkg
 7762  -rw-   165657204  Aug 1 2016 04:45:49 +00:00
cat3k_caa-guestshell.16.05.01a.SPA.pkg
 7764  -rw-    17408636  Aug 1 2016 04:45:49 +00:00  cat3k_caa-webui.16.05.01a.SPA.pkg
 7749  -rw-    21902119  Aug 1 2016 06:09:38 +00:00  cat3k_caa-rpbase.16.06.01.SPA.pkg
 7760  -rw-   253094520  Aug 1 2016 06:09:41 +00:00  cat3k_caa-rpcore.16.06.01.SPA.pkg
 7755  -rw-     7326336  Aug 1 2016 06:09:39 +00:00
cat3k_caa-srdriver.16.06.01.SPA.pkg
 7750  -rw-   165667444  Aug 1 2016 06:09:39 +00:00
cat3k_caa-guestshell.16.06.01.SPA.pkg
 7759  -rw-    16829052  Aug 1 2016 06:09:39 +00:00  cat3k_caa-webui.16.06.01.SPA.pkg
1621966848 bytes total (137928704 bytes free)
Switch#
Switch# dir flash:*.conf
Directory of flash:/*.conf

Directory of flash:/

 7766  -rw-        5137  Aug 1 2016 06:10:39 +00:00
cat3k_caa-universalk9.16.06.01.SPA.conf
 7769  -rw-        5125  Aug 1 2016 06:11:19 +00:00  packages.conf
1621966848 bytes total (137928704 bytes free)
Switch#
```

Step 6 After you have successfully installed the image, you do not need the .bin image and the file can be deleted from the flash of EACH switch if you had it copied to flash.

```
Switch# delete flash:cat3k_caa-universalk9.16.06.01.SPA.bin
Delete filename [cat3k_caa-universalk9.16.06.01.SPA.bin]?
Delete flash:/ cat3k_caa-universalk9.16.06.01.SPA.bin? [confirm]
Switch#
```

Reload

Step 7 Reload the switch

```
Switch# reload
```

Step 8 If your switches are configured with auto boot, then the stack will automatically boot up with the new image. If not, you can manually boot flash:packages.conf

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

Note When you boot the new image, it will automatically update the boot loader.

Step 9 When the new image boots up, you can verify the version of the new image, using the **show version** command:

```
Switch# show version
Cisco IOS XE Software, Version 16.06.1
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.06.1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Thu 25-May-17 16:39 by mcpre
```

Downgrade from Cisco IOS XE 16.x.x to Cisco IOS XE 3.xE in Install Mode

Follow these instructions to downgrade from Cisco IOS XE 16.x.x to older Cisco IOS XE 3.xE releases in Install Mode.

Clean Up

Step 1 Ensure you have enough space in flash to expand a new image by cleaning up old installation files.

Note 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.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
```

```
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.05.01a.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#
```

Copy New Image to Stack

Step 2 Copy the target Cisco IOS XE 3.xE image to flash: (you can skip this step if you want to use the image from your TFTP server).

```
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#
```

Step 3 Use the **dir flash** 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  Nov 25 2015 18:17:21 +00:00
cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin

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

Downgrade Software Image

Step 4 Use the **request platform software package install** command with the **new** option to downgrade your stack. You can point to the source image on your tftpserver or in flash if you have it copied to flash.

Note Use the **switch all** option is needed 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 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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.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.16.05.01a.SPA.pkg
  Removed cat3k_caa-rpcore.16.05.01a.SPA.pkg
  Removed cat3k_caa-srdriver.16.05.01a.SPA.pkg
  Removed cat3k_caa-guestshell.16.05.01a.SPA.pkg
  Removed cat3k_caa-webui.16.05.01a.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]
```

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

Step 5 After you have successfully installed the image, you no longer need the .bin image and the file can be deleted 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#
```

Reload

Step 6 Reload the switch

```
Switch# reload
```

Step 7 If your switches are configured with auto boot, then the stack will automatically boot up with the new image. If not, you can manually boot flash:packages.conf

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

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

Downgrade from Cisco IOS XE 16.x.x to Cisco IOS XE 3.xE in Bundle Mode

Follow these instructions to downgrade from Cisco IOS XE 16.x.x in Bundle mode to an older Cisco IOS XE 3.xE release in Bundle mode.

Copy New Image to Stack

Step 1 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
```

Step 2 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#
```

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

Step 3 Use the **dir flash** 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  Nov 25 2015 18:17:21 +00:00
cat3k_caa-universalk9.SPA.03.07.02.E.152-3.E2.bin

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

Edit the Boot variable

Step 4 Clear the boot variable

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

Step 5 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
```

Step 6 Use the **write memory** command to save the configuration change.

```
Switch# write memory
```

Step 7 Use the **show boot** command to confirm 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#
```

Reload

Step 8 Reload the switch

```
switch# reload
```

Step 9 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

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

Note When you downgrade to a Cisco IOS XE 3.xE image, your boot loader will remain updated, and will automatically be downgraded. The new boot loader can support booting both Cisco IOS XE 3.x releases as well as Cisco IOS XE Denali 16.x.x and Cisco IOS XE Everest 16.x.x releases..

Step 10 When the new image boots up, you can verify the version of the new image, by checking **show version**

```
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
```

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

Step 11 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 3.xE bin image file, so ensure that you copy it to your Active 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.16.05.01a.SPA.pkg
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
    cat3k_caa-universalk9.16.05.01a.SPA.bin
```

```
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
    cat3k_caa-webui.16.05.01a.SPA.pkg
    packages.conf
[2]: Files that will be deleted:
    cat3k_caa-rpbase.16.05.01a.SPA.pkg
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
    cat3k_caa-universalk9.16.05.01a.SPA.bin
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
    cat3k_caa-webui.16.05.01a.SPA.pkg
    packages.conf
[3]: Files that will be deleted:
    cat3k_caa-rpbase.16.05.01a.SPA.pkg
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
    cat3k_caa-universalk9.16.05.01a.SPA.bin
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
    cat3k_caa-webui.16.05.01a.SPA.pkg
    packages.conf
[4]: Files that will be deleted:
    cat3k_caa-rpbase.16.05.01a.SPA.pkg
    cat3k_caa-rpcore.16.05.01a.SPA.pkg
    cat3k_caa-srdriver.16.05.01a.SPA.pkg
    cat3k_caa-universalk9.16.05.01a.SPA.bin
    cat3k_caa-guestshell.16.05.01a.SPA.pkg
    cat3k_caa-webui.16.05.01a.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#
```

Step 12 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#
```

Step 13 Use the **software expand** 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#
```

Edit the Boot variable

Step 14 Clear the boot variable

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

Step 15 Edit the boot variable to point to the new image.

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

Step 16 Use the **write memory** command to save the configuration change.

```
Switch# write memory
```

Step 17 Use the **show boot** 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#
```

Reload

Step 18 Reload the switch

```
Switch#reload
```

Step 19 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

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

Step 20 When the new image boots up, you can verify the version of the new image, by checking **show version**

```
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 21 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 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#
```

Upgrading RTU Licenses

The EXEC mode **Right to Use License** command allows you to activate or deactivate feature set licenses. This command provides options to activate or deactivate any license supported on the platform.

license right-to-use [**activate** | **deactivate**] [**lanbase** | **ipbase** | **ipservices**] {**evaluation**} [**all** | **slot** *switch-id*] {**acceptEULA**}

Configuration Examples:

Ugrading an IP Base SKU to IP Services License

Step	Command	Purpose
1	**license right-to-use activate ipservices slot** *switch-ID* **acceptEULA**	Activate IP Services license. Enter the switch ID. Enter **acceptEULA** to indicate acceptance.
2	**show license right-to-use summary**	Check the reboot license level is ipservices.
3	**reload**	Reboot the switch to boot with ipservices.

Evaluating IP Services License on IP Base SKU

Step	Command	Purpose
1	**license right-to-use activate ipservices evaluation slot** *switch-ID* **acceptEULA**	Activate IP Services evaluation license. Enter the switch ID. Enter **acceptEULA** to indicate acceptance.
2	**show license right-to-use summary**	Check the reboot license level is ipservices eval.
3	**reload**	Reboot the switch to boot with ipservices eval.

Deactivating Evaluation IP Services License on IP Base SKU

Step	Command	Purpose
1	**license right-to-use deactivate ipservices evaluation slot** *switch-ID*	Deactivates IP Services evaluation license.
2	**show license right-to-use summary**	Check the reboot license level is ipbase.
3	**reload**	Reboot the switch to boot with ipbase.

Upgrading LAN Base Stack to IP Base Stack

Step	Command	Purpose
1	**license right-to-use activate ipbase all acceptEULA**	Activate IP Base license on all the switches in the stack. Enter **acceptEULA** to indicate acceptance.

Step	Command	Purpose
2	**show license right-to-use**	Check the reboot license level is ipbase for all the switches.
3	**reload**	Reboots the switch to boot with ipbase.

Changing the License Level of License Mismatch Switch from Active's Console

If the license mismatch switch has a lower license level than other switches in the stack, and the stack is running at IP Services and the mismatch switch is booted with IP Base license.

Step	Command	Purpose
1	**show switch**	Get the switch number in license mismatch state.
2	**show license right-to-use mismatch**	Check the license level of the license mismatch switch.
3	**license right-to-use activate ipservices slot** *switch-id* **acceptEULA**	Activate IP Services license on all the mismatch switches in the stack. Enter **acceptEULA** to indicate acceptance.
4	**reload slot** *switch-id*	Reboot the license mismatch switch to boot with ipservices and join the stack.

If the license mismatch switch has a higher license level than other switches in the stack, and the stack is running at IP Base and the mismatch switch is booted with IP Services license.

Step	Command	Purpose
1	**show switch**	Get the switch number in license mismatch state.
2	**show license right-to-use mismatch**	Check the license level of the license mismatch switch.
3	**license right-to-use activate ipbase slot** *switch-id* **acceptEULA**	Activate IP Base license on the license mismatch switch. Enter **acceptEULA** to indicate acceptance..
4	**reload slot** *switch-id*	Reboots the license mismatch switch to boot with ipbase and join the stack.

Feature Sets

The Cisco Catalyst 3650 Series Switches supports three different feature sets:

- LAN Base feature set—Provides basic Layer 2+ features, including access control lists (ACLs) and quality of service (QoS), and up to 255 VLANs.

- IP Base feature set—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, EIGRP stub routing, IP multicast routing, Routing Information Protocol (RIP), basic IPv6 management, the Open Shortest Path First (OSPF) Protocol (for routed access only), and support for wireless controller functionality. The license supports up to 4094 VLANs.
- IP Services feature set—Provides a richer set of enterprise-class intelligent services and full IPv6 support. It includes IP Base features plus Layer 3 routing (IP unicast routing and IP multicast routing). The IP Services feature set includes protocols such as the Enhanced Interior Gateway Routing Protocol (EIGRP), the Open Shortest Path First (OSPF) Protocol, and support for wireless controller functionality. The license supports up to 4094 VLANs.

For more information about the features, see the product data sheet at this URL:

http://www.cisco.com/en/US/products/ps13133/products_data_sheets_list.html

Scaling Guidelines

Table 6 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

Limitations and Restrictions

- Limitations for YANG data modeling—A maximum of 20 simultaneous NETCONF sessions are supported.
- Restrictions for QoS:
  - 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.
- Starting with Cisco IOS XE Denali 16.3.1, Centralized Management Mode (CMM) is no longer supported.
- MSE 8.x is not supported with Cisco IOS XE Denali 16.x.x.
- Smart Install — Although the commands are visible on the CLI, the Smart Install feature is not supported and will be deprecated in a later release. Enter the **no vstack** command in global configuration mode and disable the feature. Use the Cisco Plug-n-Play feature instead.
- WIPs is not supported with Cisco IOS XE Denali 16.x.x since the CMX WIPs solution is not available.
- You cannot configure NetFlow export using the Ethernet Management port (g0/0).
- The maximum committed information rate (CIR) for voice traffic on a wireless port is 132 Mb/sec.
- Flex Links are not supported. We recommend that you use spanning tree protocol (STP) as the alternative.

- Outdoor access points are supported only when they are in Local mode.
- Restrictions for Cisco TrustSec:
  - Dynamic SGACL download is limited to 6KB per destination group tag (DGT).
  - Cisco TrustSec 802.1x is not supported.
  - Cisco TrustSec Critical Auth is not supported.
  - Cisco TrustSec can be configured only on physical interfaces, not on logical interfaces.
  - Cisco TrustSec for IPv6 is not supported.
  - Cisco TrustSec cannot be configured on a pure bridging domain with IPSG feature enabled. You must either enable IP routing or disable the IPSG feature in the bridging domain.
- 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.
- When a logging discriminator is configured and applied to a device, memory leak is seen under heavy syslog or debug output. The rate of the leak is dependent on the quantity of logs produced. In extreme cases, the device may crash. As a workaround, disable the logging discriminator on the device.
- When the device is running SCP (Secure Copy Protocol) 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 take upto 40 or 50 percent of CPU memory, but they do not cause the device to shutdown.

Caveats

Caveats describe unexpected behavior in Cisco IOS 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, page 47
- Open Caveats in Cisco IOS XE Everest 16.5.1a, page 48
- Resolved Caveats in Cisco IOS XE Everest 16.5.1a, page 49

Cisco Bug Search Tool

The Bug Search Tool (BST), which is the online successor to Bug Toolkit, is designed to improve the effectiveness in network risk management and device troubleshooting. The 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 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 listed in the open and resolved lists in this section, click on the identifier.

To access the BST (use your Cisco user ID and password) go to https://tools.cisco.com/bugsearch/. Enter the bug ID in the **Search For:** field.

Open Caveats in Cisco IOS XE Everest 16.5.1a

The following are the open caveats in Cisco IOS XE Denali 16.3.x. Click on the identifier to view the details of a caveat in the BST.

Identifier	Description
CSCve29218	Intermittently on 48p 3850 switch, one of the 4x10G uplink interfaces doesn't come up after upgrade
CSCvd01545	MSTP is blocked on trunk when native vlan does not exist
CSCuz48487	Catalyst 3850 drops MacSec traffic
CSCvc59766	Outgoing ACL get hit by the traffic generated by/from the switch itself while using Denali IOSes
CSCvc63975	Ping fails with RSPAN configured when SRC and DEST(remote-span) vlans are allowed on the same trunk
CSCvc96706	Denali 16.3.2 not providing PoE after bouncing the port.
CSCvc85100	3850 Should not install Policy Map that has a Table-map action in police used with priority feature
CSCvd03465	Switch prevents updating MAC address in multi-host mode
CSCvc47165	SFP port detect link-flap error and it's in error-disabled state on 3650
CSCvb39796	SNMP Trap is not include entPhysicalDescr and entPhysicalName on C3850
CSCuw59595	Cannot get expected packet rate for PQ in output QoS policy
CSCvd20857	3850 Stack may reload when making config changes
CSCvd05280	DBM Crash on Active Switch while changing DCA channels
CSCuz61879	Ports in new standby not mirrored SPAN/ERSPAN
CSCvd33197	3850 Uplink port goes down after reload due to udld err-Disable on remote end
CSCvb91970	FED crash at dev_macsec_get_tx_sa_nextpn upon reload
CSCvc72794	16.3.3: SV stack split to dual active randomly
CSCve45102	Observed traceback after loading the image
CSCvd33716	REP: multicast flooding seen with node reload and link flap on the REP ring
CSCvd42535	"mtu 17892" is automatically created under LISP0 interface with system mtu cfg
CSCvd71236	LISP: PIM-SM_ Registration Process was not Successful between RP and Source of Multicast
CSCvc97252	PTP neighbor p-delay values are fluctating b/w nano seconds to hours with Audio science MINI
CSCva76630	RSPAN traffic is not encrypted on CTS MACSEC SAP link
CSCvc20807	MPLS over Macsec is not working
CSCva90016	Rx/Tx LPI Status on the verification of EEE is none instead of Low Power
CSCvc83011	WDAVC: cisco-jabber-audio & ms-lync protocol becomes unknown on WS-C3850
CSCvd21642	SIT [FED2.0 2/16 image]: MKA-128: 3850CR-CSR traffic failing after rekey
CSCve29218	Edison switch uplink 10g interface doesn't come up after reload

Identifier	Description
CSCve30033	WDAVC: FNF and WDAVC not functional on newton24P
CSCve38240	3850 iPXE: DHCPv4 user-class option should use Microsoft format instead of RFC3004 format
CSCvd70351	MVPN: Traffic not resumed after switchover

Resolved Caveats in Cisco IOS XE Everest 16.5.1a

Identifier	Description
CSCuw51380	object-group ACL CLI should not be supported at 3850
CSCvc44042	Traffic coming in C3650 from a GRE tunnel interface an outgoing ACL applied on SVI doesn't work.
CSCug83616	3850 packet counter value wraps around after a long time
CSCvc89645	SGACL enforcement under VRF unexpectedly blocking traffic
CSCur31055	Ten gig links gets err-disable after "UDLD enable" on 3850
CSCvc39894	LOOP packets still can be seen when "no keepalive" configured
CSCvd80714	High CPU Usage on 3850 running Polaris when it received ipv4 packets with options
CSCvc51326	port-security // restrict // does not filter traffic after shutdown/no shutdown
CSCvc88106	Entropy exhaustion leading to IOSd Crash on Standby Switch with FIPS enabled
CSCvc06109	3650 1G/10G SFP link down if only remove SFP Tx cable
CSCvc57865	3850 stack port use SFP-10G-LR became suspend after show command and stack switchover
CSCvc44041	CRC Errors on Uplink interface of WS-C3650-24PDM & WS-C3650-48FQM-S.
CSCvc73079	"Speed nonegotiate" disappeared after ORI'ing SFP on back-to-back switch
CSCvc26787	%LINEPROTO-5-UPDOWN: Line protocol on Interface TenGigabitEthernet1/1/4, changed state to down
CSCvc55074	3650 FED Tracelogs for devobj generated continously with default logging
CSCvb69066	3650/3850 traffic not passing on the interface with GLC-GE-100FX (3.6.5/3.7.4)
CSCvc99866	inconsistent index mapping between cpeExtPsePortEntPhyIndex and entPhysicalName
CSCvb53858	Power Supply SN incomplete (only 10 characters)
CSCvd02101	QSFP-40G-SR-BD shows speed as 1000Mb/s
CSCuw77959	1801M - %DATACORRUPTION-1-DATAINCONSISTENCY: copy error
CSCvc62532	HTTP connection may fail when IPv6 address is configured on any interface
CSCvc74968	3850 "snmp-server queue-length" Value Back to Default 10 after Reload
CSCvc24401	Downlink port LEDs display green without plugging anything in the port
CSCva56147	No DHCP request sent out of Mgmt -port on 3850
CSCvc07544	Vlan gets automatically pruned even when host or svi is up when pruning ena

Identifier	Description
CSCvc32612	8x10 uplink module will disable ports when booting in a G24
CSCvd01407	CISCO_LWAP_AUTO_SMARTPORT ACCESS_VLAN=45 macro not working for cheetah ap's

Troubleshooting

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

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

Choose **Product Support > Switches**. Then choose your product and click **Troubleshoot and Alerts** to find information for the problem that you are experiencing.

Related Documentation

- Cisco IOS XE Denali 16.x.x documentation at this URL:

  http://www.cisco.com/c/en/us/products/ios-nx-os-software/ios-xe/index.html
- Catalyst 3650 switch documentation at this URL:

  http://www.cisco.com/go/cat3650_docs
- Error Message Decoder at this URL:

  https://www.cisco.com/cgi-bin/Support/Errordecoder/index.cgi

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation*, which lists all new and revised Cisco Technical documentation, as an RSS feed and deliver content directly to your desktop using a read application. The RSS feeds are a free service.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

© 2017 Cisco Systems, Inc. All rights reserved.