Release Notes for Cisco Catalyst 3650 Series Switches, Cisco IOS XE Everest 16.6.x

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This release note gives an overview of the features for the Cisco IOS XE Everest 16.6.x 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.

- For information about unsupported features, see Important Notes, page 9.
- For information about software and hardware restrictions and limitations, see Limitations and Restrictions, page 53.
- For information about open issues with the software and past opens that are resolved, see Caveats, page 55.

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.

Whats New in Cisco IOS XE Everest 16.6.10

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.9

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.8

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.7

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.6

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.5

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.4a

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.4

There are no new hardware or software features in this release.

Whats New in Cisco IOS XE Everest 16.6.3

Software Features in Cisco IOS XE Everest 16.6.3

Feature Name	Description
Software Maintenance Upgrade	SMU is a package that can be installed on a system, to provide a patch fix or security resolution to a released image. See System Management -> Software Maintenance Upgrade.

Whats New in Cisco IOS XE Everest 16.6.2

Software Features in Cisco IOS XE Everest 16.6.2

Feature Name	Description
EIGRP Stub Routing	The Enhanced Interior Gateway Routing Protocol (EIGRP) Stub Routing feature is now available at the LAN Base license level, with IPv4 and IPv6. See Routing -> Configuring IP Unicast Routing. (LAN Base, IP Base, and IP Services)
YANG Data Models	YANG Data Models—For the list of Cisco IOS XE YANG models available with this release, navigate to https://github.com/YangModels/yang/tree/master/vendor/cisco/xe/1662. (LAN Base, IP Base, and IP Services)

Whats New in Cisco IOS XE Everest 16.6.1

Hardware Features in Cisco IOS XE Everest 16.6.1

Feature Name	Description
Cisco QSFP to SFP or SFP+ Adapter (Cisco QSA Module)	Cisco Catalyst 3650 Series Switches support the Cisco QSA Module, which is a pluggable adapter that converts a QSFP port in to an SFP+ port. You can connect only an SFP+ module. See SFP, SFP+, and QSFP+ Modules.

Software Features in Cisco IOS XE Everest 16.6.1

Feature Name	Description, License Level Information, and Documentation Link
New in Wired Switching	
Cisco Discovery Protocol (CDP) Bypass	A backward compatible mode, equivalent to not having CDP support. When the feature is enabled, CDP packets are received and transmitted unchanged. Received packets are not processed; no packets are generated. In this mode, 'bump-in-the-wire' behavior is applied to CDP packets. See Security -> Cisco Discovery Protocol Bypass. (LAN Base, IP Base, and IP Services)
Cisco Nonstop Forwarding (NSF) Support for IPv6	Cisco NSF is now supported for IPv6 traffic. Cisco NSF works with the Stateful switchover (SSO) feature to minimize the amount of time a network is unavailable to its users following a switchover. See Stack Manager and High Availability -> Configuring Cisco NSF with SSO. (IP Services)
High Availability: (1:1) Redundancy	Determines the active and standby role for a specific switch in a stack, based on the flash rommon variable. See Stack Manager and High Availability -> Configuring 1:1 Redundancy. (LAN Base, IP Base, and IP Services)
Internet Group Management Protocol (IGMP) Explicit Tracking	Enables a multicast device to explicitly track the membership of all multicast hosts in a particular multiaccess network. The explicit tracking of hosts, groups, and channels enables the device to keep track of each individual host that is joined to a particular group or channel. See IP Multicast Routing -> IGMP Explicit Tracking. (LAN Base, IP Base, and IP Services)
IP-Prefix and SGT-Based SXP Filtering	Provides a filtering mechanism to solve the high IP-Scalable Group Tag (SGT) bindings scale issue. When bindings are exported or imported, filters are provided on a per-peer basis or globally (applicable to all SXP connections) with an option to filter either as a listener or a speaker. The filtering can also be done based on IP prefixes or SGT. See Cisco TrustSec Switch Configuration Guide -> IP-Prefix and SGT-Based SXP Filtering. (IP Services)

LAN Base enhancements for routing protocols	These protocols are now available at the LAN Base license level, with IPv4 and IPv6: • Routing Information Protocol (RIP) • Open Shortest Path First (OSPF) • Policy-Based Routing (PBR) • Protocol Independent Multicast Stub Routing (PIM Stub Routing) Routed access is supported at the LAN Base license level, with IPv4 and IPv6: • OSPF — up to 1000 routes • Multicast — up to 1000 routes See IP Multicast Routing and Routing.
IPv6 Multicast with Virtual Private Networks (VPN) Routing Forwarding Table (VRF-Lite)	Allows a service provider to support two or more VPNs with overlapping IP addresses using one interface. VRF-Lite uses input interfaces to distinguish routes for different VPNs and forms virtual packet-forwarding tables by associating one or more Layer 3 interfaces with each VRF. See IP Multicast Routing -> Configuring VRF-lite. (IP Services)
Locator ID Separator Protocol (LISP) Extranet Support and Source Group Access Control List (SGACL) Cell Statistics	• LISP Extranet Support—Refers to subscriber to provider communication across instance IDs in a LISP network. With LISP Extranet support, hosts in VRF "A", for example, can access shared resources in VRF "B". • SGACL Cell Statistics—An enhancement in the **show cts role-based counters ipv4** command, to display all SGACL enforcement statistics for IPv4, providing visibility at the cell level. See Campus Fabric. (IP Services)

Multiprotocol Label Switching	The following MPLS features are introduced in this release:
• Ethernet over MPLS (EoMPLS) • Virtual Private LAN Services (VPLS) • EIGRP MPLS VPN PE-CE Site of Origin (SoO) • Route Target Rewrite • external BGP (eBGP) and internal BGP (iBGP) OR eiBGP • IPv6 Provider Edge over MPLS (6PE) • IPv6 VPN Provider Edge over MPLS (6VPE)	• EoMPLS—One of the Any Transport over MPLS (AToM) transport types. EoMPLS provides a tunneling mechanism for Ethernet traffic through an MPLS-enabled Layer 3 core. It encapsulates Ethernet protocol data units (PDUs) inside MPLS packets and uses label stacking to forward them across the MPLS network. • VPLS—A class of VPN that supports the connection of multiple sites in a single bridged domain over a managed IP/MPLS network. VPLS uses the provider core to join multiple attachment circuits together, to simulate a virtual bridge that connects the multiple attachment circuits together. • EIGRP MPLS VPN PE-CE SoO—Introduces the capability to filter MPLS Virtual Private Network (VPN) traffic on a per-site basis for Enhanced Interior Gateway Routing Protocol (EIGRP) networks. SoO filtering is configured at the interface level and is used to manage MPLS VPN traffic, and to prevent transient routing loops from occurring in complex and mixed network topologies. • Route Target Rewrite—Allows the replacement of route targets on incoming and outgoing Border Gateway Protocol (BGP) updates. Route targets are carried as extended community attributes in BGP Virtual Private Network IP Version 4 (VPNv4) updates. Route target extended community attributes are used to identify a set of sites and VPN routing and forwarding (VRF) instances that can receive routes with a configured route target. • eiBGP— Enables you to configure multipath load balancing with both eBGP and iBGP paths in Border Gateway Protocol (BGP) networks that are configured to use MPLS VPNs. The feature provides improved load balancing deployment and service offering capabilities and is useful for multi-homed autonomous systems and Provider Edge (PE) routers that import both eBGP and iBGP paths from multihomed and stub networks. • 6PE—A technique that provides global IPv6 reachability over IPv4 MPLS. It allows one shared routing table for all other devices. 6PE allows IPv6 domains to communicate with one another over the IPv4 without an explicit tunnel setup, requiring only one IPv4 address per IPv6 domain. • 6VPE—A mechanism to use the IPv4 backbone to provide VPN IPv6 services. 6VPE is like a regular IPv4 MPLS-VPN provider edge, with an addition of IPv6 support within VRF. It provides logically separate routing table entries for VPN member devices. See Multiprotocol Label Switching. (IP Services)

Programmability	Programmability features introduced or enhanced in this release:
• Zero-Touch Provisioning (ZTP): HTTP Download. • Model-Driven Telemetry • In-Service Model Update • YANG Data Models	• ZTP—Now supports HTTP file download along with TFTP file download. • Model-Driven Telemetry—Provides a mechanism to stream data from a Model-Driven Telemetry-capable device, to a destination. The data to be streamed is driven through subscription. The feature is enabled automatically, when NETCONF-YANG is started on a device. • In-Service Model Update package— Updates YANG data models on a device. • YANG Data Models—For the list of Cisco IOS XE YANG models available with this release, navigate to https://github.com/YangModels/yang/tree/master/vendor/cisco/xe/1661. Revision statements embedded in the YANG files indicate if there has been a model revision. The *README.md* file in the same github location highlights changes that have been made in the release. See the Programmability Configuration Guide, Cisco IOS XE Everest 16.6.1. (LAN Base, IP Base, and IP Services)
Stateful Switchover (SSO) Support for IPv6	SSO is now supported for IPv6 traffic. With this feature, when an active switch fails, the standby switch starts up in a fully-initialized state and synchronizes with the persistent configuration and the running configuration of the active switch. The new active switch uses existing Layer 2 switching information to continue forwarding traffic. See Stack Manager and High Availability -> Configuring Cisco NSF with SSO. (IP Base and IP Services)

Trustworthy Systems: Simplified Factory Reset	Removes all the customer specific data that has been added to the device since the time of its shipping.
	Enter the **factory-reset all** command to erase all the content from the NVRAM, all Cisco IOS images including the current boot image, boot variables, startup and running configuration data, and user data. The Onboard Failure Logging (OBFL) logs and the crash information are also deleted.
	No system configuration is required to use the factory reset command. Use the command with all options enabled.
	Do not unplug the power or interrupt the factory reset operation.
	The system reloads to perform the Factory Reset. Note that after this operation, you can load the IOS image either through a USB or TFTP.
	Use cases for the feature:
	• Return Material Authorization (RMA) for a device—If you have to return a device to Cisco for RMA, remove all customer-specific data before obtaining a RMA certificate for the device.
	• Recovering the compromised device—If the key material or credentials stored on a device is compromised, reset the device to factory configuration and then reconfigure the device.
	(LAN Base, IP Base, and IP Services)(LAN Base, IP Base, and IP Services)
Virtual Private Network Routing and Forwarding- Aware (VRF-Aware) Generic Routing Encapsulation (GRE)	Enables you to configure the source and destination of a GRE IP tunnel to belong to any VRF table.
	See Routing -> Configuring Generic Routing Encapsulation (GRE) Tunnel IP Source and Destination VRF Membership.
	(IP Base and IP Services)
New in Software-Defined Access Wireless	
Software-Defined Access Wireless (SD-Wireless)	The Enterprise Fabric provides end-to-end enterprise-wide segmentation, flexible subnet addressing, and controller-based networking with uniform enterprise-wide policy and mobility. It moves the enterprise network from current VLAN-centric architecture to a user group-based enterprise architecture, with flexible Layer 2 extensions within and across sites.
	See Campus Fabric -> Software-Defined Access Wireless.
	(IP Services)

New on the Web User Interface	
Web UI support for DNS Proxy and troubleshooting	Features introduced and updated on the Web UI in this release: • DNS Proxy Support • Troubleshooting- Audit Device Configuration • Troubleshooting- Debug Bundle

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 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 16.6.x.

- 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 16.6.3 release.

- The following features are not supported in Cisco IOS XE Everest 16.6.x:
  - 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

- – Ingress Strict Priority Queuing (Expedite)

- – Stack ports buffer is not shared as part of the shared pool. The dedicated buffer for stack ports can only be used by stack ports.

- – 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
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

Table 1   Catalyst 3650 Switch Models (continued)

Switch Model	Cisco IOS Image	Description
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
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

Table 1 *Catalyst 3650 Switch Models (continued)*

Switch Model	Cisco IOS Image	Description
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
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

Table 1   Catalyst 3650 Switch Models (continued)

Switch Model	Cisco IOS Image	Description
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
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

Table 1   Catalyst 3650 Switch Models (continued)

Switch Model	Cisco IOS Image	Description
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   Software Compatibility Matrix

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Everest 16.6.10	Not applicable	Not applicable	Not applicable	2.4	5.4 5.5	PI 3.9 See Prime Infrastructure 3.9 on cisco.com
Everest 16.6.9	Not applicable	Not applicable	Not applicable	2.4	5.4 5.5	PI 3.9 See Prime Infrastructure 3.9 on cisco.com
Everest 16.6.8	Not applicable	Not applicable	Not applicable	2.4	5.4 5.5	PI 3.8 See Prime Infrastructure 3.8 on cisco.com

Table 2   Software Compatibility Matrix

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Everest 16.6.7	Not applicable	Not applicable	Not applicable	2.2 2.3 2.4	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
Everest 16.6.6	Not applicable	Not applicable	Not applicable	2.2 2.3 2.4	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
Everest 16.6.5	Not applicable	Not applicable	Not applicable	2.2 2.3 2.4	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
Everest 16.6.4a	Not applicable	Not applicable	Not applicable	2.2 2.3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack[2] See Prime Infrastructure 3.1 on cisco.com
Everest 16.6.4	Not applicable	Not applicable	Not applicable	2.2 2.3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack[2] See Prime Infrastructure 3.1 on cisco.com
Everest 16.6.3	Not applicable	Not applicable	Not applicable	2.2 2.3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack[2] See Prime Infrastructure 3.1 on cisco.com
Everest 16.6.2	Not applicable	Not applicable	Not applicable	2.2 2.3	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack[2] See Prime Infrastructure 3.1 on cisco.com
Everest 16.6.1	Not applicable	Not applicable	Not applicable	2.2	5.4 5.5	PI 3.1 + PI 3.1 latest maintenance release + PI 3.1 latest device pack[2] See Prime Infrastructure 3.1 on cisco.com
Everest 16.5.1a	Not applicable	Not applicable	Not applicable	2. 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

Table 2   Software Compatibility Matrix

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
Denali 16.3.7	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.1 Patch 1 (Wired and Wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1.5 + PI 3.1.5 update 1 + PI 3.1 latest device pack (Wired) 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 16.3.6	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.1 Patch 1 (Wired and Wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1.5 + PI 3.1.5 update 1 + PI 3.1 latest device pack (Wired) 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 16.3.5b	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.1 Patch 1 (Wired and Wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1.5 + PI 3.1.5 update 1 + PI 3.1 latest device pack (Wired) 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 16.3.5	03.07.04E 03.06.05E	8.2.0, 8.3.0	CMX 10.2.2	2.1 Patch 1 (Wired and Wireless)	5.4 5.5	PI update PI 3.1 + PI 3.1.5 + PI 3.1.5 update 1 + PI 3.1 latest device pack (Wired) 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.

Table 2   Software Compatibility Matrix

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
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)
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

Table 2 Software Compatibility Matrix

Catalyst 3650	Cisco 5700 WLC	Cisco 5508 or WiSM2	MSE/CMX	ISE	ACS	Cisco PI
03.06.04E 03.06.03E 03.06.02aE 03.06.01E 03.06.00E	03.06.04E 03.06.02aE 03.06.01E 03.06.00E	8.0 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 10 or later
  - Mac OS X 10.9.5

- Browsers
  - Google Chrome—Version 38 and later (On Windows)
  - Microsoft Internet Explorer—Version 11 or later (On Windows 7 and Windows XP), and Microsoft Edge (On Windows 10)
  - 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.

Table 4   Software Images

Release	Image	File Name
Cisco IOS XE Everest 16.6.10	Universal	cat3k_caa-universalk9.16.06.10.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.10.SPA.bin
Cisco IOS XE Everest 16.6.9	Universal	cat3k_caa-universalk9.16.06.09.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.09.SPA.bin
Cisco IOS XE Everest 16.6.8	Universal	cat3k_caa-universalk9.16.06.08.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.08.SPA.bin
Cisco IOS XE Everest 16.6.7	Universal	cat3k_caa-universalk9.16.06.07.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.07.SPA.bin
Cisco IOS XE Everest 16.6.6	Universal	cat3k_caa-universalk9.16.06.06.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.06.SPA.bin
Cisco IOS XE Everest 16.6.5	Universal	cat3k_caa-universalk9.16.06.05.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.05.SPA.bin
Cisco IOS XE Everest 16.6.4a	Universal	cat3k_caa-universalk9.16.06.04a.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.04a.SPA.bin
Cisco IOS XE Everest 16.6.4	Universal	cat3k_caa-universalk9.16.06.04.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.04.SPA.bin
Cisco IOS XE Everest 16.6.3	Universal	cat3k_caa-universalk9.16.06.03.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.03.SPA.bin

Table 4   Software Images (continued)

Release	Image	File Name
Cisco IOS XE Everest 16.6.2	Universal	cat3k_caa-universalk9.16.06.02.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.02.SPA.bin
Cisco IOS XE Everest 16.6.1	Universal	cat3k_caa-universalk9.16.06.01.SPA.bin
	Universal without DTLS	cat3k_caa-universalk9ldpe.16.06.01.SPA.bin

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 16.6.x in Install Mode
- Upgrading from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.6.x in Bundle Mode
- Upgrading from Cisco IOS XE Denali 16.x.x to Cisco IOS XE Everest 16.6.x in Install Mode
- Upgrading or Downgrading from Cisco IOS XE Everest 16.6.x to a Cisco IOS XE 16.x.x Release 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

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 5   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

Table 5   *Software Installation CLI Commands (continued)*

`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.

Table 6   *Automatic Boot Loader Response*

Scenario	Automatic Boot Loader Response

If you boot Cisco IOS XE Everest 16.6.2, or Cisco IOS XE Everest 16.6.3, or Cisco IOS XE Everest 16.6.4, or Cisco IOS XE Everest 16.6.4a, or Cisco IOS XE Everest 16.6.5, or Cisco IOS XE Everest 16.6.6, or Cisco IOS XE Everest 16.6.7, or Cisco IOS XE Everest 16.6.8, or Cisco IOS XE Everest 16.6.9, or Cisco IOS XE Everest 16.6.10 for the first time	The boot loader may be upgraded to version 4.66. For example:
	
	```BOOTLDR: CAT3K_CAA Boot Loader (CAT3K_CAA-HBOOT-M) Version 4.66, RELEASE SOFTWARE (P)```
	
	If the automatic boot loader upgrade occurs, while booting, you will see the following on the console:
	
	```%IOSXEBOOT-Tue-###: (rp/0): Oct 17 13:07:19 Universal 2017 PLEASE DO NOT POWER CYCLE ### BOOT LOADER UPGRADING 4```
	```%IOSXEBOOT-loader-boot: (rp/0): upgrade successful 4```

If you boot Cisco IOS XE Everest 16.6.1 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 16.6.x 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 16.6.x 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 24.

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://10.28.11.250/cat3k_caa-universalk9.16.06.01.SPA.bin flash:
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 - 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-universalk9.16.06.01.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-universalk9.16.06.01.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.16.06.01.SPA.pkg
    Added cat3k_caa-rpcore.16.06.01.SPA.pkg
    Added cat3k_caa-srdriver.16.06.01.SPA.pkg
    Added cat3k_caa-guestshell.16.05.01a.SPA.pkg
    Added cat3k_caa-webui.16.06.01.SPA.pkg
[2]: 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
[3]: 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
[4]: 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
[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 16.06.01
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.6.1, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Sat 22-Jul-17 03:00 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-universalk9.16.06.01.SPA.bin
Delete filename [cat3k_caa-universalk9.16.06.01.SPA.bin]?
Delete flash:/cat3k_caa-universalk9.16.06.01.SPA.bin? [confirm]
Switch#
```

Upgrading from Cisco IOS XE 3.xE to Cisco IOS XE Denali 16.x.x, or Cisco IOS XE Everest 16.6.x 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 16.6.x 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-universalk9.16.06.01.SPA.bin flash:
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 - 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-universalk9.16.06.01.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-universalk9.16.06.01.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-universalk9.16.06.01.SPA.bin;

Boot Variables on next reload:
BOOT variable = flash:cat3k_caa-universalk9.16.06.01.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. If not, you can manually boot flash: cat3k_caa-universalk9.16.06.01a.SPA.bin

```
switch:boot flash:cat3k_caa-universalk9.16.06.01.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 16.06.01
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.6.1, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Sat 22-Jul-17 03:00 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-universalk9.16.06.01.SPA.bin flash:
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 - 373203016 bytes]

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

Step 13   Use the **request platform software package expand switch all file flash:image.bin auto-copy**
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-universalk9.16.06.01.SPA.bin auto-copy
[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.
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 16.06.01
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.6.1, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Sat 22-Jul-17 03:00 by mcpre
```

Upgrading from Cisco IOS XE Denali 16.x.x to Cisco IOS XE Everest 16.6.x in Install Mode

Follow these instructions to upgrade from Cisco IOS XE Denali 16.x.x to Cisco IOS XE Everest 16.6.x 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.

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.
```

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://10.28.11.250/cat3k_caa-universalk9.16.06.01.SPA.bin flash:
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 - 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-universalk9.16.06.01.SPA.bin

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

Set Boot Variable

Step 4 Use the boot system flash:packages.conf command to set the boot variable.

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

Use the write memory command to save boot settings.

```
Switch# write memory
```

Use this command to verify **BOOT variable = flash:packages.conf**

```
Switch# show boot system
```

Software Install Image to Flash

Step 5 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:

```
Switch# 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-universalk9.16.06.01.SPA.bin new 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

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.16.06.01.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.16.01.01E.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.16.06.01.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.16.01.01E.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.16.06.01.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.16.01.01E.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.16.06.01.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.
[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 6　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.16.06.01.SPA.pkg
30996-rw-266177140 Aug  1 2016 04:40:36 -07:00 cat3k_caa-rpcore.16.06.01.SPA.pkg
30998-rw-9067132   Aug  1 2016 04:40:37 -07:00 cat3k_caa-srdriver.16.06.01.SPA.pkg
30999-rw-178403952 Aug  1 2016 04:40:38 -07:00 cat3k_caa-guestshell.16.06.01.SPA.pkg
30997-rw-13333112  Aug  1 2016 04:40:37 -07:00 cat3k_caa-webui.16.06.01.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 7　After you have successfully installed the image, you no longer need the.bin image. If you copied the file to flash

    1.　Enter the **dir flash:*.bin** command to check if it is still saved in the the flash of each switch.

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

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

32339 -rw-373217171 May 26 2017 13:52:53 -07:00 cat3k_caa-universalk9.16.06.01.SPA.bin
1562509312 bytes total (731021312 bytes free)
Switch#

Switch#
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 8　Reload the switch.

```
Switch# reload
```

Step 9　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 10   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 16.06.01
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Version 16.6.1, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Sat 22-Jul-17 03:00 by mcpre
```

Upgrading or Downgrading from Cisco IOS XE Everest 16.6.x to a Cisco IOS XE 16.x.x Release in Install Mode

Follow these instructions to upgrade from Cisco IOS XE Everest 16.6.x to a future Cisco IOS XE 16.x.x release in Install mode, or to downgrade from Cisco IOS XE Everest 16.6.x to an earlier Cisco IOS XE Denali 16.x.x or Cisco IOS XE Everest 16.x.x release in install mode. Sample output in the example is of an upgrade scenario; the same steps apply when you downgrade as well.

Clean Up

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

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.16.06.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.06.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.06.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-guestshell.16.06.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-webui.16.06.01.SPA.pkg
      File is in use, will not delete.
  done.

SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 2
Cleaning up unnecessary package files
  Scanning boot directory for packages ... done.
  Preparing packages list to delete ...
    packages.conf
      File is in use, will not delete.
    cat3k_caa-rpbase.16.06.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-rpcore.16.06.01.SPA.pkg
      File is in use, will not delete.
    cat3k_caa-srdriver.16.06.01.SPA.pkg
```

```
        File is in use, will not delete.
    cat3k_caa-guestshell.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-webui.16.06.01.SPA.pkg
        File is in use, will not delete.
  done.

SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 3
Cleaning up unnecessary package files
  Scanning boot directory for packages ... done.
  Preparing packages list to delete ...
    packages.conf
        File is in use, will not delete.
    cat3k_caa-rpbase.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-rpcore.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-srdriver.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-guestshell.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-webui.16.06.01.SPA.pkg
        File is in use, will not delete.
  done.

SUCCESS: No extra package or provisioning files found on media. Nothing to clean.
Running command on switch 4
Cleaning up unnecessary package files
  Scanning boot directory for packages ... done.
  Preparing packages list to delete ...
    packages.conf
        File is in use, will not delete.
    cat3k_caa-rpbase.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-rpcore.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-srdriver.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-guestshell.16.06.01.SPA.pkg
        File is in use, will not delete.
    cat3k_caa-webui.16.06.01.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-universalk9.16.08.01.SPA.bin
flash:cat3k_caa-universalk9.16.08.01.SPA.bin
Destination filename [cat3k_caa-universalk9.16.08.01.SPA.bin]?
Accessing tftp://5.28.11.250/cat3k_caa-universalk9.16.08.01.SPA.bin...
Loading cat3k_caa-universalk9.16.08.01.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-universalk9.16.08.01.SPA.bin
1621966848 bytes total (598597632 bytes free)
Switch#
```

Set Boot Variable

Step 4   Use the boot system flash:packages.conf command to set the boot variable.

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

Use the write memory command to save boot settings.

```
Switch# write memory
```

Use this command to verify **BOOT variable = flash:packages.conf**

```
Switch# show boot system
```

Software Install Image to Flash

Step 5   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:

```
Switch# 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-universalk9.16.08.01.SPA.bin auto-copy
Expanding image file: flash:cat3k_caa-universalk9.16.08.01.SPA.bin
[1]: Copying flash:cat3k_caa-universalk9.16.08.01.SPA.bin from switch 1 to switch 2 3
4
[2 3 4]: Finished copying to switch 2 3 4
[1 2 3 4]: Expanding file
[1 2 3 4]: Finished expanding all-in-one software package in switch 1 2 3 4
SUCCESS: Finished expanding all-in-one software package.
[1 2 3 4]: Performing install
```

```
                      SUCCESS: install Finished
              [1]: install package(s) on switch 1
              --- Starting list of software package changes ---
              Old files list:
                Removed cat3k_caa-rpbase.16.06.01.SPA.pkg
                Removed cat3k_caa-rpcore.16.06.01.SPA.pkg
                Removed cat3k_caa-srdriver.16.06.01.SPA.pkg
                Removed cat3k_caa-guestshell.16.06.01.SPA.pkg
                Removed cat3k_caa-webui.16.06.01.SPA.pkg
              New files list:
                Added cat3k_caa-rpbase.16.08.01.SPA.pkg
                Added cat3k_caa-rpcore.16.08.01.SPA.pkg
                Added cat3k_caa-srdriver.16.08.01.SPA.pkg
                Added cat3k_caa-guestshell.16.08.01.SPA.pkg
                Added cat3k_caa-webui.16.08.01.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.16.06.01.SPA.pkg
                Removed cat3k_caa-rpcore.16.06.01.SPA.pkg
                Removed cat3k_caa-srdriver.16.06.01.SPA.pkg
                Removed cat3k_caa-guestshell.16.06.01.SPA.pkg
                Removed cat3k_caa-webui.16.06.01.SPA.pkg
              New files list:
                Added cat3k_caa-rpbase.16.08.01.SPA.pkg
                Added cat3k_caa-rpcore.16.08.01.SPA.pkg
                Added cat3k_caa-srdriver.16.08.01.SPA.pkg
                Added cat3k_caa-guestshell.16.08.01.SPA.pkg
                Added cat3k_caa-webui.16.08.01.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.16.06.01.SPA.pkg
                Removed cat3k_caa-rpcore.16.06.01.SPA.pkg
                Removed cat3k_caa-srdriver.16.06.01.SPA.pkg
                Removed cat3k_caa-guestshell.16.06.01.SPA.pkg
                Removed cat3k_caa-webui.16.06.01.SPA.pkg
              New files list:
                Added cat3k_caa-rpbase.16.08.01.SPA.pkg
                Added cat3k_caa-rpcore.16.08.01.SPA.pkg
                Added cat3k_caa-srdriver.16.08.01.SPA.pkg
                Added cat3k_caa-guestshell.16.08.01.SPA.pkg
                Added cat3k_caa-webui.16.08.01.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.16.06.01.SPA.pkg
                Removed cat3k_caa-rpcore.16.06.01.SPA.pkg
                Removed cat3k_caa-srdriver.16.06.01.SPA.pkg
                Removed cat3k_caa-guestshell.16.06.01.SPA.pkg
                Removed cat3k_caa-webui.16.06.01.SPA.pkg
              New files list:
                Added cat3k_caa-rpbase.16.08.01.SPA.pkg
                Added cat3k_caa-rpcore.16.08.01.SPA.pkg
                Added cat3k_caa-srdriver.16.08.01.SPA.pkg
```

```
  Added cat3k_caa-guestshell.16.08.01.SPA A.pkg
  Added cat3k_caa-webui.16.08.01.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 6   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.16.06.01.SPA.pkg
7765-rw-253160056 Aug 1 2016 04:45:50 +00:00 cat3k_caa-rpcore.16.06.01.SPA.pkg
7763-rw-7328384   Aug 1 2016 04:45:49 +00:00 cat3k_caa-srdriver.16.06.01.SPA.pkg
7762-rw-165657204 Aug 1 2016 04:45:49 +00:00 cat3k_caa-guestshell.16.06.01.SPA.pkg
7764-rw-17408636  Aug 1 2016 04:45:49 +00:00 cat3k_caa-webui.16.06.01.SPA.pkg
7749-rw-21902119  Aug 1 2016 06:09:38 +00:00 cat3k_caa-rpbase.16.08.01.SPA.pkg
7760-rw-253094520 Aug 1 2016 06:09:41 +00:00 cat3k_caa-rpcore.16.08.01.SPA.pkg
7755-rw-7326336   Aug 1 2016 06:09:39 +00:00 cat3k_caa-srdriver.16.08.01.SPA.pkg
7750-rw-165667444 Aug 1 2016 06:09:39 +00:00 cat3k_caa-guestshell.16.08.01.SPA.pkg
7759-rw-16829052  Aug 1 2016 06:09:39 +00:00 cat3k_caa-webui.16.08.01.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-universalk9.16.08.01.SPA.conf
7769-rw-5125  Aug 1 2016 06:11:19 +00:00 packages.conf
1621966848 bytes total (137928704 bytes free)
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.

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.

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.

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**}

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.
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.

Step	Command	Purpose
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), up to 255 VLANs, support for routing protocols (Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Policy-Based Routing (PBR), Protocol Independent Multicast Stub Routing (PIM Stub Routing) with IPv4 and IPv6, and routed access with IPv4 and IPv6 (OSPF — up to 1000 routes, Multicast — up to 1000 routes).

- IP Base 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, Enhanced Interior Gateway Routing Protocol (EIGRP) stub routing, IP multicast routing, RIP, basic IPv6 management, the OSPF Protocol (for routed access only). The license supports up to 4094 VLANs.

- IP Services 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 EIGRP, OSPF Protocol. 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 7   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

- Control Plane Policing (CoPP)—Starting with Cisco IOS XE Everest 16.6.4, the **show run** command does not display information about classes configured under system-cpp policy, when they are left at default values. Use the **show policy-map system-cpp-policy** or the s**how policy-map control-plane** commands in privileged EXEC mode instead.

- Smart Install—The feature is deprecated starting with Cisco IOS XE Everest 16.5.1a. The commands are visible on the CLI until Cisco IOS XE Everest 16.6.1, but the feature is not supported. Enter the **no vstack** command in global configuration mode and disable the feature. Starting from Cisco IOS XE Everest 16.6.2, the **vstack** command is not available on the CLI.

- 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.

- 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 (GigabitEthernet0/0).

- 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 show as much as 40 or 50 percent CPU usage, 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

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

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

Open Caveats in Cisco IOS XE Everest 16.6.x

Identifier	Description
CSCvk60809	Wrong Time-Stamp is saved in pcap.
CSCvn98703	FED_QOS_ERRMSG-3-POLICER_HW_ERROR on Catalyst 3650 running 16.6 releases
CSCvq72713	Cat3k/Cat9k can't forwarding traffic follow the rule of EIGRP unequal cost load-balancing
CSCvr21001	QoS with policing traffic that do not match the ACL on the class-map
CSCvt17066	SNMP inetCidrRouteNumber counter value incorrect
CSCvt65890	Cat3650 routed port can't be a source port when vlan filter is enabled

Resolved Caveats in Cisco IOS XE Everest 16.6.10

Identifier	Description
CSCvt53563	Cisco IOS XE Software NETCONF and RESTCONF Authentication Bypass Vulnerability
CSCvw25564	Cisco IOS and IOS XE Software IKEv2 AutoReconnect Feature Denial of Service Vulnerability
CSCvw46194	IOS and IOS XE Software UDLD Denial of Service Vulnerability
CSCvx41294	High CPU usage caused by "TCP Timer" process
CSCvx66699	Cisco IOS and IOS XE Software TrustSec CLI Parser Denial of Service Vulnerability

Resolved Caveats in Cisco IOS XE Everest 16.6.9

Identifier	Description
CSCvv48305	Route not fully programmed in the hardware for MACSec enabled end-point
CSCvt30243	DNA - LAN Automation doesn't configure link between Peer Device and PnP Agent due CDP limitation

Resolved Caveats in Cisco IOS XE Everest 16.6.8

Identifier	Description
CSCvm40582	Crash when entering username with aaa common-criteria policy password
CSCvp73666	DNA - LAN Automation doesn't configure link between Peer Device and PnP Agent due CDP limitation
CSCvq56114	Cat3k crash in IGMP code due to invalid source count in DNS lookup
CSCvr03905	Memory Leak on FED due to IPv6 Source Guard
CSCvr20522	Cat3k/9k BOOTREPLY dropped when DHCP snooping is enabled
CSCvr23882	Kernel crash at Free_pipe_info
CSCvr41906	Imax error on adjacent interfaces in port-group
CSCvr46931	ports remain down/down object-manager (fed-ots-mo thread is stuck)
CSCvr59959	Cat3k/9k Flow-based SPAN(FSPAN) can only work in one direction when mutilple session configured
CSCvr86020	C3650 traffic not passing on interface with GLC-GE-100FX

Resolved Caveats in Cisco IOS XE Everest 16.6.7

Identifier	Description
CSCvj16691	port LED may turn to amber
CSCvn30230	Slow memory leak in linux_iosd-imag
CSCvn81334	Default ACL being enforced even when dACL is applied after Reload
CSCvo27371	Memory leak in MACSec seen during SAP scale longevity
CSCvo34804	Stack SFP cannot be recognized on some port and the port link also do not up
CSCvo36435	MACSEC Non-zero CO value cause packet drops even though Session remain up.
CSCvo65974	QinQ tunnels causing L2 loop in specific topology.
CSCvo71264	Gateway routes DHCP offer incorrectly after DHCP snooping
CSCvo83305	MAC Access List Blocks Unintended Traffic
CSCvo85183	Uplinkfast take time when recovery from link failure
CSCvo85422	Directly connected IPv4/IPv6 hosts not programmed in HW - %FMFP-3-OBJ_DWNLD_TO_DP_FAILED
CSCvo94058	URPF packet drop despite "rx allow-default" option
CSCvp00026	No audio during first few seconds of voice call between 2 Fabric Edge
CSCvp15389	Port security configuration on interface causing connectivity issue
CSCvp26792	Control plane impacted when > 1Gbps multicast passes through and no entry in IGMP snooping
CSCvp30239	Memory leak when there are constant changes in REP ring
CSCvp34411	PTP does not work on 1G uplink due to high neighbor propagation delay
CSCvp43131	Mgmt port "speed 1000" and "negotiation auto" in show run
CSCvp54779	[SDA] 1st ARP Reply is dropped at remote Fabric Edge
CSCvp66089	Interface hung after reboot the device
CSCvp69629	Authentication sessions does not come up on configuring dot1x when there is active client traffic.
CSCvp75221	Modules shows faulty status when specific MAC ACL is applied on interfaces
CSCvp88369	Switch crashes while accessing OBFL
CSCvp90279	ADV and REP DHCPv6 packets are sent to SISF when source udp port is not 547
CSCvq01185	SNMP-3-RESPONSE_DELAYED: and timeout when polling ent Sensor Value Entry
CSCvq10937	Free Memory list corruption.
CSCvq17759	DACL not properly enforced when pre auth ACL present for some phones.
CSCvq22011	ARP replies are dropped when IPDT gleans from ARP
CSCvq30316	[SDA] 1st ARP fix for CSCvp00026 is eventually failing after longevity

Identifier	Description
CSCvq30460	SYS-2-BADSHARE: Bad refcount in datagram_done - messages seen during system churn
CSCvq40137	Mac address not being learnt when "auth port-control auto" command is present
CSCvq44397	ospf down upon switchover with aggressive timers "hello-interval 1" and "dead-interval 4"

Resolved Caveats in Cisco IOS XE Everest 16.6.6

Identifier	Description
CSCvn08296	DNA Center 1.2.5 - SDA Border as RP incorrectly resolving RPF next-hop as LISP interface
CSCvo32446	High CPU Due To Looped Packet and/or Unicast DHCP ACK Dropped
CSCuw36080	SNMP with Extended ACL
CSCvg73991	PBR adjacency not getting updated correctly after shut/no shut on interface
CSCvm07353	Router may crash when a SSH session is closed after configure TACACS
CSCvm48084	Remark in DACL causes Authorization failure
CSCvm89086	SPAN destination interface not dropping ingress traffic
CSCvm91340	C3650 link down with speed 100/full duplex after device reboot up
CSCvn01822	cmnMacMoveNotification is generated when a MAC address is moved between same Port-channel interface
CSCvn23706	no mac address-table notification mac-move can't be saved after reload device
CSCvn31477	Layer 2 SSM Multicast traffic hitting the CPU when SVI is configured with PIM Spare Mode
CSCvn46517	some sgacl were not installed after update a Cell in ISE
CSCvn56579	MQIPC memory corruption resulting dot1x/MAB not working for wired clients
CSCvn72973	Device is getting crashed on the "cts role-based enforcement"
CSCvn74807	Cisco TrustSec crash while processing CoA update
CSCvn79221	MAC ADDRESS LEARNING FAILURE ON PORT CONFIGURED WITH PORT-SECURITY
CSCvn96821	Stack adapter authentication failed
CSCvo15594	MATM programming issue for remote client
CSCvo42353	SDA; Cat3K,Cat9K:-External border creating incorrect CEF/map-cache entry due to multicast
CSCvo59504	Cat3K	Cat9K - SVI becomes inaccessible upon reboot

Resolved Caveats in Cisco IOS XE Everest 16.6.5

Identifier	Description
CSCvg81784	Converting a layer 2 port-channel to L3 causes some Protocols to break
CSCvh85885	IPv6 stale entries not expiring
CSCvi02406	LED ON on one end and OFF on the other end when looped back
CSCvi48988	SNMP timeout when querying entSensorValueEntry
CSCvi96965	Radius Automate Tester probe on feature is not working as expected.
CSCvj79694	sgt-map gets cleared for some of the end points for unknown reason
CSCvj92201	16.6.4:Device-tracking does not consistenly show DH4 for DHCP clients
CSCvk20003	Polaris: Host limit of 32 for session monitoring sessions
CSCvk26426	Slowness for x11perf with MGig port on 3850.
CSCvk30813	MAB fails to start negotiation after device moves to another layer 2 adjacent switch
CSCvk32774	ACE entry with *established or range * in ACL drops TCP/UDP packets.
CSCvk32866	SISF probing behavior should be changed from broadcast to unicast
CSCvk34927	DHCP snooping table not updated from DHCP snooping DB file upon reload.
CSCvk39041	SDA: IP phone latency in fabric is close to 4 sec's
CSCvk48653	3650 "show macsec interface" hang and intermittent traffic loss.
CSCvk50081	Interface on standby switch in stack is not coming up after soft reload
CSCvk60752	DHCP offer with Option 82 but no Remote ID suboption dropped by CAT9K relay agent
CSCvk63089	show logging onboard switch active uptime detail shows 133 years as uptime
CSCvm00765	BFD crash on imitating traffic loss
CSCvm33622	WCCP redirection to proxy server breaks in certain scenarios.
CSCvm35904	16.6.3: Access Tunnel Create Interface code is considered to be update request in FMAN_FP
CSCvm36333	MAC address programming issue
CSCvm39894	False authorizations and authentications even without radius server for dot1x/mab
CSCvm43071	[IBNS 2.0] aaa-available event is not being triggered when using authentication/authorization list
CSCvm46814	session management process smd crash at cts_sga due to TDL memory depletion.
CSCvm60720	Broadcast Gratuitous ARP changed to unicast by switch leading to DHCP decline from client
CSCvm62274	Multicast traffic is software switched when switch is provisioned as Edge in Fabric - SDA Deployment
CSCvm63651	Memory leak due to authentication mac-move permit
CSCvm75378	Cat9x00: IPv6 SPAN filter still applied in hardware when removing entire monitor session
CSCvm86135	SMD crash after removing access-session attributes filter-list

Identifier	Description
CSCvm89005	Packets looped internally during VXLAN decap in SD-Access environment
CSCvm95352	uRPF TCAM Resources exhausted even without uRPF configured on the switch
CSCvm97660	C9300 reflects back traffic on the same interface
CSCvn08672	DHCP packets cause unknown protocol drops on 16.6.x
CSCvn36398	WCCP Access-list might not be removed from interface after a WCCP loss of service
CSCvn46171	Rapid Memory Leak in "FED Main Event" Process due to Modifying Adjacencys

Resolved Caveats in Cisco IOS XE Everest 16.6.4a

Identifier	Description
CSCvm01064	PE stops VPLS traffic forwarding after xconnect flap
CSCvj83551	SISF crash in IPV6 neighbor discovery packets
CSCvm01609	3850/3650- Mgig ports may fail to come up after upgrading to 16.6.4
CSCvk31115	Device-sensor doesn't send data off initial boot
CSCvj86644	SDA: DHCP does not remove option 82 when sending packets to end-hosts
CSCvk42902	ACL is not passing traffic after upgrading to 16.6.4 from 3.7.4E. in a heavy ACL deployment
CSCvk39041	SDA: IP phone latency in fabric is close to 4 sec's
CSCvk02589	Connectivity is lost every four hours when ipv4 and ipv6 dual stack is configured.
CSCvk03823	WS-C3650-48FQM and WS-C3650-24PD Getting Noisy after few weeks of up time
CSCvj33865	Clearing mac address table should not delete entries created by control plane/remote entries
CSCvk07070	Observing bmalloc smd leaks at OBJ_WEBAUTH_LOGOUT_URL with webauth
CSCvk16813	DHCP client traffic dropped with DHCP snooping and port-channel or cross stack uplinks.
CSCvk46664	DNA Center SWIM Upgrade fails and unable to upgrade manually
CSCvk50734	Device Tracking - Memory leak observed with IPv6 NS/NA Packets .
CSCvk53444	Packets with Fragment Offset not forwarded with DHCP Snooping Enabled in 16.6.4
CSCvm09121	Evaluation of IOS-XE for CVE-2018-5391 (FragmentSmack)
CSCvj76259	MOSFET fault 3850/3650 suddenly stops providing PoE on certain ports

Resolved Caveats in Cisco IOS XE Everest 16.6.4

The following are the resolved caveats in Cisco IOS XE Everest 16.6.4.

Caveat ID Number	Description
CSCvi83373	Repetitive logs show up 47K times in fed tracelogs
CSCvj16271	Addressing memory leaks in IPC error handling cases in LED, RPS, VMARGIN, USB, THERMAL
CSCvh72868	FlowSequence value in CiscoNetflow/IPFIX is always "0" in Denali 16.6.2
CSCvj52681	dynamic vlan assignment causes all sisf entires under the port to be deleted
CSCvi91714	IPv6 address not assigned or delayed when RA Guard is enabled
CSCvi76084	Device-tracking entry stuck in TENTATIVE for certain Mac Pro hosts configured with static IP
CSCvi38916	Persistent Telnet and SSH crashes when configured in 16.6.2
CSCvi26398	"%LISP-4-LOCAL_EID_RLOC_INCONSISTENCY" should be supporessed in SDA context
CSCvi20882	Netconf IP-SLA udp-jitter case missing leaf codec
CSCvi11970	Abnormal output for show pnp tech-support
CSCvh85772	Switch not responding to ARP request for GW Anycast IP
CSCvh79942	Chunk corruption crash related to PNP or Guestshell
CSCvh21909	LISP: Overlapping prefix causes "probe-down" for map-cache entry
CSCvh09334	SDA-IPV6::SISF traceback @ar_relay_create_entry - L2 Binding tbl entry insertion failed
CSCvg45950	packet drop seen intermittently if 40G traffic sent via cts interface
CSCvb69966	Memory leak under LLDP Protocol process
CSCvg89940	Adjacency Objects fail to program and connectivity gets lost - %FMFP-3-OBJ_DWNLD_TO_DP_FAILED
CSCvh85071	Device returns incorrect SNMP value for oid 1.3.6.1.4.1.9.9.390.1.2.2.1.8 (ccdTdrIfResultPairStatus)
CSCvh11581	netflow export packet Vlan ID display as "unknown" in packet capture
CSCvg53159	%SNMP-3-RESPONSE_DELAYED: processing GetNext of cafSessionEntry.2 seen on catalyst switch
CSCvc47165	SFP port detect link-flap error and it's in error-disabled state
CSCvg77396	Port went to err-disable due to link-flap detected after shutdown no shut
CSCvh11396	Switchport Security Command triggering Bulk Sync Failure
CSCvh28402	optical signal present on shut interface with "cts manual"
CSCvh48269	Stack member loses connection to active on single cable auth failure
CSCvh48397	create_directory_cache: failed to stat flash message see when device managed by dnac
CSCvh60088	3850/3650 running 16.3.5b, unresponsive on save with multiple privilege commands
CSCvh70501	Continuous CRCs seen on links using ACWXXX GLC-GE-100FX
CSCvh84345	IOS CLI "show platform software fed switch active punt cause summary" may display negative counts

Caveat ID Number	Description
CSCvh85482	memory utilization increasing for tams_proc
CSCvh89372	Memory leak in linux_iosd-imag and/or platform_mgr
CSCvi06186	stack logging onboard(OBFL) config disappear after switchover
CSCvi08459	set different words for username and password, but username shown the same as password
CSCvi15897	Silent Reload on Cat3850/3650 running Everest 16.6.2
CSCvi19809	Memory leak in TMS process
CSCvi38191	Memory leak in lman process due to "ld_license_ext.dat" build-up.
CSCvi39202	DHCP fails when DHCP snooping trust is enabled on uplink etherchannel
CSCvi93137	Voice domain not forwarding for certain clients
CSCvg41950	Cisco IOS XE Software Diagnostic Shell Path Traversal Vulnerability
CSCvh71539	Command "show aaa servers" reloads the switch
CSCvj49476	Telnet Sessions Hang/Become unavailable at execution of "show run"

Resolved Caveats in Cisco IOS XE Everest 16.6.3

The following are the resolved caveats in Cisco IOS XE Everest 16.6.3.

Identifier	Description
CSCvh31431	Memory leak in linux_iosd-image on 16.6 releases.
CSCvg25493	VLANs are not programmed correctly when configuration pushed using scripting tool.
CSCve03476	DHCP relayed packets not forwarded when DHCP snooping is enabled on the switch.
CSCvf27728	Catalyst 3k improve Last Reload Reason.
CSCvg01236	3850/3650 not send out ARP to PBR nexthop
CSCvh52882	Memory Leak due to nbar config.
CSCvh69402	Dot1x specific configuration applied but not working on the interface.
CSCvh81152	Local SVI IP is registered as dynamic-eid.
CSCvf81218	SFP showing unknown status in show interface on stack standby device.
CSCvf96466	GLC-TE 100M link shows notconnect after SFP reseat or reload 3850.
CSCvg08146	Fragment packets is denied by "deny icmp any any redirect".
CSCvg58932	Qos classification issue with NBAR
CSCvg60156	CTS fails to enforce RBACLs on known mappings
CSCvg70013	GLC-T/SFP-GE-T 100M link is half duplex after reinserting SFP or reloading device.
CSCvg75317	Reload standby device of stack, lacp PDU packet stopped sending from active device.
CSCvg81139	ping failure for more than 10 seconds after REP topo change.
CSCvg95142	running multicast traffic 3850 crashed by fed process.

Identifier	Description
CSCvh06383	16.6.x: Intermittent traffic loss for MAB devices after successful intial authentication
CSCvh13345	FED crash with MPLS.
CSCvf77371	Ethernet Trailer or additional bytes are added by 3650 in GRE Tunnel.
CSCvg34039	WS-C3650-12X48UR : no traffic over tex/1/7 ports.
CSCvg48154	UDLD error disables the 10G interface when enabling "udld aggresive" on peer.
CSCvg62818	When polling duplex status using dot3StatsDuplexStatus SNMP does not show correct value.
CSCvg66077	Default static smartport macros are not presented on 3850 running 16.x.x version.
CSCvg96399	Hardware OutDrops interface counter is cloned on the Software OutDrops interface counter.
CSCvg56727	crashes with 'server-key' command using key of 128 characters or more.
CSCvh60525	CLI 'aaa common-criteria' not available on IPBASEK9 license.
CSCve32330	%UTIL-6-RANDOM: A pseudo-random number was generated twice in succession.
CSCvf43271	Traceback: Stack master crash at dot1x authentication.
CSCvg22515	After upgrade of IOS, SSH passwords longer than 25 characters do not work.
CSCvg60288	Device IP address AV pair replaced with 192.168.1.5.
CSCvh32416	Evaluation of all for CPU Side-Channel Information Disclosure Vulnerability.
CSCvh55578	To add recovery mechanism for glean entry.
CSCvf84349	Router crash on polling cEigrpPeerEntry.

Resolved Caveats in Cisco IOS XE Everest 16.6.2

The following are the resolved caveats in Cisco IOS XE Everest 16.6.2.

Identifier	Description
CSCvd47737	Catalyst 3650 -missing/not able to poll- dot1dStaticTable within BRIDGE-MIB.
CSCve48888	Catalyst 3650 switch getting noisy after few weeks.
CSCve88714	Stack member crash on disconnecting one stack cable.
CSCvf33073	WS-C3650-24PD: Traffic does not resume after SFP OIR.
CSCvf39197	Mac not learn for VLAN 325 with port security enabled.
CSCvf47917	Ping failed between wired and wireless client for above 140 bytes.
CSCvf75518	Controller port error interface.
CSCvf99697	WS-C3650-48FQM-E running Cisco IOS XE Denali 16.3.3 keeps generating FRU alarms.

Resolved Caveats in Cisco IOS XE Everest 16.6.1

The following are the resolved caveats in Cisco IOS XE Everest 16.6.1.

Identifier	Description
CSCuw59595	Cannot get expected packet rate for PQ in output QoS policy
CSCva90016	Rx/Tx LPI Status on the verification of EEE is none instead of Low Power
CSCvb91970	Switch Crash in the FED Process
CSCvc20807	16.3.3: MPLS over Macsec is not working
CSCvc63975	Ping fails with RSPAN configured when SRC and DEST (remote-span) vlans are allowed on the same trunk
CSCvc72794	16.3.3: SV: SV stack split to dual active randomly
CSCvc83011	WDAVC: Cisco-jabber-audio & ms-lync protocol becomes unknown on WS-C3850
CSCvc85100	Should not install Policy Map that has a Table-map action in police used with priority feature
CSCvc96706	Denali 16.3.2 not providing PoE after bouncing the port.
CSCvc97252	PTP neighbor p-delay values are fluctuating b/w nano seconds to hours with Audio science MINI
CSCvd01545	MSTP is blocked on trunk when native vlan does not exist
CSCvd03465	Switch prevents updating MAC address in multi-host mode
CSCvd05280	DBM Crash on Active Switch while changing DCA channels
CSCvd20857	Stack may reload when making config changes
CSCvd21642	MKA-128 traffic failing after rekey
CSCvd33197	Denali: Uplink port goes down after reload due to udld err-Disable on remote end
CSCvd33716	16.3.3 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
CSCvd70351	MVPN: Traffic not resumed after switchover
CSCvd71236	LISP: PIM-SM_ Registration Process was not Successful between RP and Source of Multicast
CSCve29218	4X10G Uplink interface doesn't come up during boot, happens very infrequently.
CSCve30033	WDAVC: FNF and WDAVC not functional.
CSCve38240	iPXE: DHCPv4 user-class option should use Microsoft format instead of RFC3004 format
CSCuz61879	Ports in new standby not mirrored SPAN/ERSPAN.

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:

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

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