



# Release Notes for the Catalyst 4500-X Series Switches, Cisco IOS XE Release 3.6.xE

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## Current release

**IOS XE 3.6.8E—January 31, 2018**

## Prior releases

**IOS XE 3.6.7E—July 10, 2017, IOS XE 3.6.6E—December 23, 2016, IOS XE 3.6.5aE, IOS XE 3.6.5E, IOS XE 3.6.4E, IOS XE 3.6.3E, IOS XE 3.6.2E, IOS XE 3.6.1E, IOS XE 3.6.0E**

This release note describes the features, modifications, and caveats for the Cisco IOS XE 3.6.0E software on the Catalyst 4500-X Series switch.

Cisco IOS XE 3.6.0E is a feature rich new software feature release for IOS and IOS-XE based Catalyst Access Switching products (Cat4500E/X, 3850/3650, 3K-X, Cat2K and 2K/3K Compact switches) which brings new innovations for Converged Access in wired and wireless topologies, IT Simplicity, Application Experience, and Mobility. This release will provide long-lived extended maintenance with planned rebuilds. It will also have all the Govt. certifications for IOS-XE and currently shipping IOS platforms.

With IOS XE 3.6.0E, Catalyst 4500-X supports VSS and Easy VSS in IP Base.

Support for Cisco IOS XE Release 3.6.0E follows the standard Cisco Systems® support policy, available at

[http://www.cisco.com/en/US/products/products\\_end-of-life\\_policy.html](http://www.cisco.com/en/US/products/products_end-of-life_policy.html)

For more information on the Catalyst 4500-X switch, visit the following URL:

<http://www.cisco.com/en/US/products/ps12332/index.html>



## Note

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Although their Release Notes are unique, the platforms Catalyst 4500E and Catalyst 4500-X use the same *Software Configuration Guide*, *Command Reference Guide*, and *System Message Guide*.

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## Cisco IOS Software Packaging

The Enterprise Services image supports all Cisco Catalyst 4500-X Series software features based on Cisco IOS Software, including enhanced routing.

The IP Base image supports Open Shortest Path First (OSPF) for Routed Access, Enhanced Interior Gateway Routing Protocol (EIGRP) "limited" Stub Routing, Nonstop Forwarding/Stateful Switchover (NSF/SSO), and RIPv1/v2. The IP Base image does not support enhanced routing features such as BGP, Intermediate System-to-Intermediate System (IS-IS), Full OSPF, Full Enhanced Interior Gateway Routing Protocol (EIGRP) & Virtual Routing Forwarding (VRF-lite).

Starting with Cisco IOS Release XE 3.5.0E, OSPF Routed Access in IP Base supports up to 1000 routes.

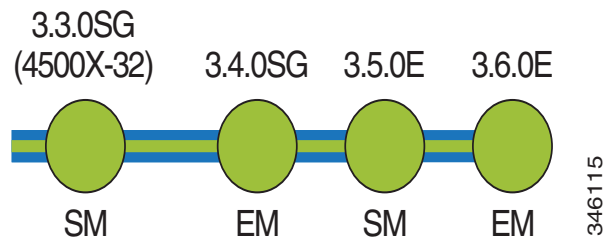
## Cisco IOS XE Release Strategy

Customers with Catalyst 4500-X Series Switches who need the latest hardware and software features should migrate to Cisco IOS Release XE 3.6.0E.

IOS XE 3.4.xSG and 3.6.xE are extended maintenance (EM) trains supporting 4500-X. IOS XE 3.3.xSG and 3.5.xE standard maintenance (SM) trains supporting 4500-X.

Figure 1 displays all the active trains.

*Figure 1 Software Release Strategy for the Catalyst 4500-X Series Switch*



## Support

Support for Cisco IOS Software Release XE 3.6.0E follows the standard Cisco Systems® support policy, available at

[http://www.cisco.com/en/US/products/products\\_end-of-life\\_policy.html](http://www.cisco.com/en/US/products/products_end-of-life_policy.html)

## System Requirements

This section describes the system requirements:

- [Supported Hardware on the Catalyst 4500-X Series Switches, page 3](#)
- [Feature Support by Image Type, page 6](#)
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## Supported Hardware on the Catalyst 4500-X Series Switches

[Table 1](#) lists the hardware supported on the Catalyst 4500-X Series switches.

*Table 1 Supported Hardware on the Cisco Catalyst 4500-X Series Switch*

Product Number (append with “=” for spares)	Product Description
<b>Small Form-Factor Pluggable Gigabit Ethernet Modules</b>	
GLC-BX-D	1000BASE-BX10-D small form-factor pluggable module For DOM support, see <a href="#">Table 4 on page 6</a> .
GLC-BX-U	1000BASE-BX10-U small form-factor pluggable module For DOM support, see <a href="#">Table 4 on page 6</a> .
GLC-EX-SMD	1000BASE-EX GE SFP ports
GLC-SX-MM	1000BASE-SX small form-factor pluggable module
GLC-SX-MMD	1000BASE-SX small form-factor pluggable module
GLC-LH-SM	1000BASE-LX/LH small form-factor pluggable module
GLC-ZX-SMD	1000BASE-ZX small form-factor pluggable module with DOM support
GLC-ZX-SM	1000BASE-ZX small form-factor pluggable module
GLC-ZX-SMD	1000BASE-ZX small form-factor pluggable module with DOM support
GLC-T	1000BASE-T small form-factor pluggable module
CWDM-SFP-xxxx	CWDM small form-factor pluggable module (See <a href="#">Table 2 on page 4</a> for a list of supported wavelengths.) For DOM support, see <a href="#">Table 4 on page 6</a> .
SFP-DWDM	Dense Wavelength-Division Multiplexing (DWDM) Small Form Factor Pluggable (SFP) module

**Table 1** Supported Hardware on the Cisco Catalyst 4500-X Series Switch (continued)

Product Number (append with "=" for spares)	Product Description
<b>SFP+ Modules</b>	
SFP-10G-SR	Cisco 10GBASE-SR SFP+ Module for MMF
SFP-10G-LR	Cisco 10GBASE-LR SFP+ Module for SMF
SFP-10G-LRM	Cisco 10GBASE-LRM SFP+ Module for MMF
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter
SFP-10G-ER	Cisco 10GBASE-ER SFP+ Module for SMF
SFP-10G-ZR	Cisco 10GBASE-ZR SFP+ Module for SMF  <b>Note</b> This module is only supported on the uplink module in the back-to-front airflow configuration.

Table 2 briefly describes the supported CWDM wavelengths in the Catalyst 4500-X Series switch.

**Table 2** CWDM SFP Supported Wavelengths on the Cisco Catalyst 4500-X Series Switches

Product Number (append with "=" for spares)	Product Description
CWDM SFP -1470	Longwave 1470 nm laser single-mode
CWDM SFP -1490	Longwave 1490 nm laser single-mode
CWDM SFP -1510	Longwave 1510 nm laser single-mode
CWDM SFP -1530	Longwave 1530 nm laser single-mode
CWDM SFP -1550	Longwave 1550 nm laser single-mode
CWDM SFP -1570	Longwave 1570 nm laser single-mode
CWDM SFP -1590	Longwave 1590 nm laser single-mode
CWDM SFP -1610	Longwave 1610 nm laser single-mode

Table 3 briefly describes the supported DWDM wavelengths on the Catalyst 4500-X Series Switches.

**Table 3** DWDM SFP Supported Wavelengths on the Cisco Catalyst 4500-X Series Switches

Product Number (append with "=" for spares)	Product Description
DWDM-SFP-6141=	Cisco 1000BASE-DWDM SFP 1561.42 nm
DWDM-SFP-6061=	Cisco 1000BASE-DWDM SFP 1560.61 nm
DWDM-SFP-5979=	Cisco 1000BASE-DWDM SFP 1559.79 nm
DWDM-SFP-5898=	Cisco 1000BASE-DWDM SFP 1558.98 nm

**Table 3** *DWDM SFP Supported Wavelengths on the Cisco Catalyst 4500-X Series Switches*

<b>Product Number</b> (append with “=” for spares)	<b>Product Description</b>
DWDM-SFP-5817=	Cisco 1000BASE-DWDM SFP 1558.17 nm
DWDM-SFP-5736=	Cisco 1000BASE-DWDM SFP 1557.36 nm
DWDM-SFP-5655=	Cisco 1000BASE-DWDM SFP 1556.55 nm
DWDM-SFP-5575=	Cisco 1000BASE-DWDM SFP 1555.75 nm
DWDM-SFP-5494=	Cisco 1000BASE-DWDM SFP 1554.94 nm
DWDM-SFP-5413=	Cisco 1000BASE-DWDM SFP 1554.13 nm
DWDM-SFP-5332=	Cisco 1000BASE-DWDM SFP 1553.33 nm
DWDM-SFP-5252=	Cisco 1000BASE-DWDM SFP 1552.52 nm
DWDM-SFP-5172=	Cisco 1000BASE-DWDM SFP 1551.72 nm
DWDM-SFP-5092=	Cisco 1000BASE-DWDM SFP 1550.92 nm
DWDM-SFP-5012=	Cisco 1000BASE-DWDM SFP 1550.12 nm
DWDM-SFP-4931=	Cisco 1000BASE-DWDM SFP 1549.32 nm
DWDM-SFP-4851=	Cisco 1000BASE-DWDM SFP 1548.51 nm
DWDM-SFP-4772=	Cisco 1000BASE-DWDM SFP 1547.72 nm
DWDM-SFP-4694=	Cisco 1000BASE-DWDM SFP 1542.94 nm
DWDM-SFP-4692=	Cisco 1000BASE-DWDM SFP 1546.92 nm
DWDM-SFP-4614=	Cisco 1000BASE-DWDM SFP 1542.14 nm
DWDM-SFP-4612=	Cisco 1000BASE-DWDM SFP 1546.12 nm
DWDM-SFP-4532=	Cisco 1000BASE-DWDM SFP 1545.32 nm
DWDM-SFP-4453=	Cisco 1000BASE-DWDM SFP 1544.53 nm
DWDM-SFP-4373=	Cisco 1000BASE-DWDM SFP 1543.73 nm
DWDM-SFP-4134=	Cisco 1000BASE-DWDM SFP 1541.35 nm
DWDM-SFP-4056=	Cisco 1000BASE-DWDM SFP 1540.56 nm
DWDM-SFP-3977=	Cisco 1000BASE-DWDM SFP 1539.77 nm
DWDM-SFP-3898=	Cisco 1000BASE-DWDM SFP 1539.98 nm
DWDM-SFP-3819=	Cisco 1000BASE-DWDM SFP 1538.19 nm
DWDM-SFP-3739=	Cisco 1000BASE-DWDM SFP 1537.40 nm
DWDM-SFP-3661=	Cisco 1000BASE-DWDM SFP 1536.61 nm
DWDM-SFP-3582=	Cisco 1000BASE-DWDM SFP 1535.82 nm
DWDM-SFP-3504=	Cisco 1000BASE-DWDM SFP 1535.04 nm
DWDM-SFP-3425=	Cisco 1000BASE-DWDM SFP 1534.25 nm
DWDM-SFP-3346=	Cisco 1000BASE-DWDM SFP 1533.47 nm
DWDM-SFP-3268=	Cisco 1000BASE-DWDM SFP 1532.68 nm
DWDM-SFP-3190=	Cisco 1000BASE-DWDM SFP 1531.90 nm

**Table 3** DWDM SFP Supported Wavelengths on the Cisco Catalyst 4500-X Series Switches

Product Number (append with "=" for spares)	Product Description
DWDM-SFP-3112=	Cisco 1000BASE-DWDM SFP 1531.12 nm
DWDM-SFP-3033=	Cisco 1000BASE-DWDM SFP 1530.33 nm

For a complete list of Cisco Gigabit Ethernet Transceiver Modules, please refer to the URL:

[http://www.cisco.com/c/en/us/td/docs/interfaces\\_modules/transceiver\\_modules/compatibility/matrix/OL\\_6981.html#38544](http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6981.html#38544)

Table 4 briefly describes the DOM support on the Catalyst 4500-X Series switches.

**Table 4** DOM Support on the Cisco Catalyst 4500-X Series Switches

SFP	GLC-BX-D
SFP	GLC-BX-U
SFP	GLC-EX-SMD
SFP	CWDM
SFP	DWDM (24 wavelengths)
SFP+	SFP-10G-ER
SFP+	SFP-10G-LR
SFP+	SFP-10G-LRM
SFP+	SFP-10G-SR
SFP+	SFP-10G-ZR

For details on transceiver module compatibility information, please refer to the URL:

[http://www.cisco.com/en/US/products/hw/modules/ps5455/products\\_device\\_support\\_tables\\_list.html](http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html)

## Feature Support by Image Type

Table 5 is a detailed list of features supported on Catalyst 4500-X Series switches running Cisco IOS Software Release 3.6.0E categorized by image type. Please visit Feature Navigator for package details:

<http://tools.cisco.com/ITDIT/CFN/>

**Table 5** IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
2-way Community Private VLANs	Yes	Yes
8-Way CEF Load Balancing	Yes	Yes
10 Gigabit Uplink Use	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
AAA Server Group	Yes	Yes
AAA Server Group Based on DNIS	Yes	Yes
ACL - Improved Merging Algorithm	Yes	Yes
ACL Logging	Yes	Yes
ACL Policy Enhancements	Yes	Yes
ACL Sequence Numbering	Yes	Yes
Address Resolution Protocol (ARP)	Yes	Yes
ANCP Client	Yes	Yes
ANSI TIA-1057 LLDP - MED Location Extension	Yes	Yes
ANSI TIA-1057 LLDP - MED Support	Yes	Yes
ARP Optimization	Yes	Yes
Auto Configuration	Yes	Yes
Auto QoS	Yes	Yes
Auto Security	Yes	Yes
Auto SmartPorts	Yes	Yes
Auto-MDIX	Yes	Yes
Auto-Voice VLAN (part of Auto QoS)	Yes	Yes
AutoInstall Using DHCP for LAN Interfaces	Yes	Yes
AutoQoS - VoIP	Yes	Yes
AutoRP Enhancement	Yes	Yes
Banner Page and Inactivity timeout for HTTP/S connections	Yes	Yes
BGP	No	Yes
BGP 4	No	Yes
BGP 4 4Byte ASN (CnH)	No	Yes
BGP 4 Multipath Support	No	Yes
BGP 4 Prefix Filter and In-bound Route Maps	No	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
BGP 4 Soft Config	No	Yes
BGP Conditional Route Injection	No	Yes
BGP Configuration Using Peer Templates	No	Yes
BGP Dynamic Update Peer-Groups	No	Yes
BGP Increased Support of Numbered as-path Access Lists to 500	No	Yes
BGP Link Bandwidth	No	Yes
BGP Neighbor Policy	No	Yes
BGP Prefix-Based Outbound Route Filtering	No	Yes
BGP Restart Neighbor Session After max-prefix Limit Reached	No	Yes
BGP Route-Map Continue	No	Yes
BGP Route-Map Continue Support for Outbound Policy	No	Yes
BGP Soft Rest	No	Yes
BGP Wildcard	No	Yes
Bidirectional PIM (IPv4 only)	Yes	Yes
Bidirectional SXP support	Yes	Yes
Boot Config	Yes	Yes
Broadcast/Multicast Suppression	Yes	Yes
Call Home	Yes	Yes
CDP (Cisco Discovery Protocol) Version 2	Yes	Yes
CDP Bypass	Yes	Yes
CDP Enhancement - Host presence TLV	Yes	Yes
CEF/dCEF - Cisco Express Forwarding	Yes	Yes
CEFv6 Switching for 6to4 Tunnels	Yes	Yes
CEFv6/dCEFv6 - Cisco Express Forwarding	Yes	Yes



Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
CFM/IEEE 802.1ag - D8.1 standard Compliant CFM, Y.1731 multicast LBM / AIS / RDI / LCK, IP SLA for Ethernet	Yes	Yes
CGMP - Cisco Group Management Protocol	Yes	Yes
Cisco IOS Scripting w/Tcl	Yes	Yes
Cisco Service Discovery Gateway Support	Yes	Yes
CiscoView Autonomous Device Manager (ADP)	Yes	Yes
Class Based Ethernet CoS Matching & Marking (802.1p & ISL CoS)	Yes	Yes
Class-Based Marking	Yes	Yes
Class-Based Policing	Yes	Yes
Class-Based Shaping	Yes	Yes
Clear Counters Per Port	Yes	Yes
CLI String Search	Yes	Yes
CNS	Yes	Yes
CNS - Configuration Agent	Yes	Yes
CNS - Event Agent	Yes	Yes
CNS - Image Agent	Yes	Yes
CNS - Interactive CLI	Yes	Yes
CNS Config Retrieve Enhancement with Retry and Interval	Yes	Yes
Command Scheduler (Kron)	Yes	Yes
Command Scheduler (Kron) Policy for System Startup	Yes	Yes
Commented IP Access List Entries	Yes	Yes
Community Private VLAN	Yes	Yes
Configuration Change Tracking Identifier	Yes	Yes
Configuration Change Notification and Logging	Yes	Yes
Configuration Replace and Configuration Rollback	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
Configuration Rollback Confirmed Change	Yes	Yes
Contextual Configuration Diff Utility	Yes	Yes
Control Plane Policing (Copp)	Yes	Yes
CPU Enhancement	Yes	Yes
CPU Optimization for Layer 3 Multicast Control Packets	Yes	Yes
Critical Authorization for Voice and Data	Yes	Yes
DAI (Dynamic ARP inspection)	Yes	Yes
DBL (Dynamic Buffer Limiting) - Selective DBL	Yes	Yes
Debounce Timer per Port	Yes	Yes
Default Passive Interface	Yes	Yes
DHCP Client	Yes	Yes
DHCP Configurable DHCP Client	Yes	Yes
DHCP Gleaning	Yes	Yes
DHCPv6 Relay Agent notification for Prefix Delegation	Yes	Yes
DHCP Option 82, Pass Through	Yes	Yes
DHCP Server	Yes	Yes
DHCP Snooping	Yes	Yes
DHCPv6 Ethernet Remote ID option	Yes	Yes
DHCPv6 Relay - Reload persistent Interface ID option	Yes	Yes
DHCPv6 Repackaging	Yes	Yes
Diffserv MIB	Yes	Yes
DSCP/CoS via LLDP	Yes	Yes
Duplication Location Reporting Issue	Yes	Yes
Dynamic Trunking Protocol (DTP)	Yes	Yes
Easy Virtual Network (EVN)	No	Yes
Easy VSS <sup>1</sup>	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
Embedded Event Manager	Yes	Yes
EIGRP	No	Yes
EIGRP Service Advertisement Framework	Yes	Yes
EIGRP Stub Routing	Yes	Yes
Embedded Event Manager (EEM) 3.2	Yes	Yes
Embedded Syslog Manager (ESM)	Yes	Yes
Energywise Agentless SNMP support	Yes	Yes
Energywise Wake-On-Lan Support	Yes	Yes
Entity API for Physical and Logical Mgd Entities	Yes	Yes
ErrDisable timeout	Yes	Yes
EtherChannel	Yes	Yes
EtherChannel Flexible PAgP	Yes	Yes
EtherChannel Enhancement - Single Port Channel	Yes	Yes
Fast EtherChannel (FEC)	Yes	Yes
FHRP - Enhanced Object Tracking of IP SLAs	Yes	Yes
FHRP - EOT integration with EEM	Yes	Yes
FHRP - GLBP - IP Redundancy API	Yes	Yes
FHRP - HSRP - Hot Standby Router Protocol V2	Yes	Yes
FHRP - Object Tracking List	Yes	Yes
Filter-ID Based ACL Application	Yes	Yes
FIPS/CC Compliance for NMSP	Yes	Yes
FIPS 140-2/3 Level 2 Certification	Yes	Yes
Flexible NetFlow - Application ID	Yes	Yes
Flexible NetFlow - CTS Fields	Yes	Yes
Flexible NetFlow - Device type	Yes	Yes
Flexible NetFlow - Ethertype	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
Flexible NetFlow - Export to an IPv6 address	Yes	Yes
Flexible NetFlow - Full Flow support	Yes	Yes
Flexible NetFlow - Ingress support	Yes	Yes
Flexible NetFlow - IPFIX	Yes	Yes
Flexible NetFlow - IPv4 Unicast Flows	Yes	Yes
Flexible NetFlow - IPv6 Unicast Flows	Yes	Yes
Flexible NetFlow - Layer 2 Fields	Yes	Yes
Flexible NetFlow - Multiple User Defined Caches	Yes	Yes
Flexible NetFlow - NetFlow Export over IPv4	Yes	Yes
Flexible NetFlow - NetFlowV5 Export protocol	Yes	Yes
Flexible NetFlow - NetFlow v9 Export Format	Yes	Yes
Flexible NetFlow - Power Reading	Yes	Yes
Flexible NetFlow - Username	Yes	Yes
Flexible NetFlow - VLAN ID support	Yes	Yes
Flex Links+(VLAN Load balancing)	Yes	Yes
FQDN ACL	Yes	Yes
Forced 10/100 Autonegotiation	Yes	Yes
FTP Support for Downloading Software Images	Yes	Yes
Gateway Load Balancing Protocol GLBP	Yes	Yes
Generic Routing Encapsulation (GRE)	Yes	Yes
GOLD Online Diagnostics	Yes	Yes
HSRP - Hot Standby Router Protocol	Yes	Yes
HSRP: Global IPv6 Address	Yes	Yes
HTTP Security	Yes	Yes
HTTP TACAC+ Accounting support	Yes	Yes
Identity 4.1 Network Edge Access Topology	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
IEEE 802.1ab LLDP (Link Layer Discovery Protocol)	Yes	Yes
IEEE 802.1ab LLDP/LLDP-MED	Yes	Yes
IEEE 802.1p Support	Yes	Yes
IEEE 802.1Q VLAN Trunking	Yes	Yes
IEEE 802.1s Multiple Spanning Tree (MST) Standard Compliance	Yes	Yes
IEEE 802.1s VLAN Multiple Spanning Trees	Yes	Yes
IEEE 802.1t <sup>2</sup>	Yes	Yes
IEEE 802.1w Spanning Tree Rapid Reconfiguration	Yes	Yes
IEEE 802.1x Auth Fail Open (Critical Ports)	Yes	Yes
IEEE 802.1x Auth Fail VLAN	Yes	Yes
IEEE 802.1x Flexible Authentication	Yes	Yes
IEEE 802.1x Multiple Authentication	Yes	Yes
IEEE 802.1x Open Authentication	Yes	Yes
IEEE 802.1x with User Distribution	Yes	Yes
IEEE 802.1x VLAN Assignment	Yes	Yes
IEEE 802.1x VLAN User Group Distribution	Yes	Yes
IEEE 802.1x Wake on LAN Support	Yes	Yes
IEEE 802.1x Authenticator	Yes	Yes
IEEE 802.1x Fallback support	Yes	Yes
IEEE 802.1x Guest VLAN	Yes	Yes
IEEE 802.1x Multi-Domain Authentication	Yes	Yes
IEEE 802.1x Private Guest VLAN	Yes	Yes
IEEE 802.1x Private VLAN Assignment	Yes	Yes
IEEE 802.1x RADIUS Accounting	Yes	Yes
IEEE 802.1x RADIUS-Supplied Session Timeout	Yes	Yes
IEEE 802.1x with ACL Assignments	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
IEEE 802.1x with Port Security	Yes	Yes
IEEE 802.3ad Link Aggregation (LACP)	Yes	Yes
IEEE 802.3ad Link Aggregation (LACP) Port-Channel Standalone Disable	Yes	Yes
IEEE 802.3x Flow Control	Yes	Yes
IGMP Fast Leave	Yes	Yes
IGMP Filtering	Yes	Yes
IGMP Snooping	Yes	Yes
IGMP Version 1	Yes	Yes
IGMP Version 2	Yes	Yes
IGMP Version 3	Yes	Yes
IGMP Version 3 - Explicit Tracking of Hosts, Groups, and Channels	Yes	Yes
IGMPv3 Host Stack	Yes	Yes
IGMP Version 3 Snooping: Full Support	Yes	Yes
Image Verification	Yes	Yes
Individual SNMP Trap Support	Yes	Yes
Interface Index Persistence	Yes	Yes
Interface Range Specification	Yes	Yes
Interface Templates	Yes	Yes
IOS Based Device Profiling	Yes	Yes
IP Enhanced IGRP Route Authentication	No	Yes
IP Event Dampening	Yes	Yes
IP Multicast Load Splitting - Equal Cost Multipath (ECMP) using S, G and Next-hop	No	Yes
IP Multicast Load Splitting across Equal-Cost Paths	Yes	Yes
IP Named Access Control List	Yes	Yes
IPv6 Tunnels (in software)	Yes	Yes

**Table 5** *IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series*

<b>Feature</b>	<b>IP Base</b>	<b>Enterprise Services</b>
IP Routing	Yes	Yes
IP SLAs - DHCP Operations	Yes	Yes
IP SLAs - Distribution of Statistics	Yes	Yes
IP SLAs - DNS Operation	Yes	Yes
IP SLAs - FTP Operation	Yes	Yes
IP SLA - HTTP Operation	Yes	Yes
IP SLAs-ICMP Echo Operation	Yes	Yes
IP SLAs - ICMP Path Echo Operation	Yes	Yes
IP SLAs - Multi Operation Scheduler	Yes	Yes
IP SLAs - One Way Measurement	Yes	Yes
IP SLAs - Path Jitter Operation	Yes	Yes
IP SLAs - Random Scheduler	Yes	Yes
IP SLAs - Reaction Threshold	Yes	Yes
IP SLAs - Responder	Yes	Yes
IP SLAs - Scheduler	Yes	Yes
IP SLAs - Sub-millisecond Accuracy Improvements	Yes	Yes
IP SLAs - TCP Connect Operation	Yes	Yes
IP SLAs - UDP Based VoIP Operation	Yes	Yes
IP SLAs - UDP Echo Operation	Yes	Yes
IP SLAs - UDP Jitter Operation	Yes	Yes
IP SLAs Video Operations	Yes	Yes
IP SLAs - VoIP Threshold Traps	Yes	Yes
IP Summary Address for RIPv2	Yes	Yes
IP Unnumbered for VLAN-SVI interfaces	Yes	Yes
IPSG (IP Source Guard) v4	Yes	Yes
IPSG (IP Source Guard) v4 for Static Hosts	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
IPv4 Policy-Based Routing	No	Yes
IPv4 Policy-Based Routing with recursive next hop	No	Yes
IPv4 Routing: Static Hosts/Default Gateway	Yes	Yes
IPv6 (Internet Protocol Version 6)	Yes	Yes
IPv6 Access Services: DHCPv6 Relay Agent	Yes	Yes
IPv6 Anycast Address	Yes	Yes
IPv6 / v4 BFD with OSPF/ BGP/ EIGRP and Static	Yes	Yes
IPv6 BGP	No	Yes
IPv6 Bootstrap Router (BSR) Scoped Zone Support	No	Yes
IPv6 CNS Agents	Yes	Yes
IPv6 Config Logger	Yes	Yes
IPv6 First Hop Security (FHS): DHCPv6 Guard IPv6 Destination Guard IPv6 Snooping (Data Gleaning, per-limit Address Limit) IPv6 Neighbor Discovery Multicast Suppression IPv6 Router Advertisement (RA) Guard	Yes	Yes
IPv6 First Hop Security (FHS) Phase 2: Binding table recovery Lightweight DHCPv6 Relay Agent (LDRA) Neighbor Discovery (ND) Multicast Suppress Source and Prefix Guard <sup>3</sup>	Yes	Yes
IPv6 HSRP	Yes	Yes
IPv6 HTTP(S)	Yes	Yes
IPv6 ICMPv6	Yes	Yes
IPv6 ICMPv6 Redirect	Yes <sup>4</sup>	Yes
IPv6 IP SLAs (UDP Jitter, UDP Echo, ICMP Echo, TCP Connect)	Yes	Yes



Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
IPv6 Interface Statistics	Yes	Yes
IPv6 MLD Snooping v1 and v2	Yes	Yes
IPv6 MTU Path Discovery	Yes	Yes
IPv6 Multicast	Yes	Yes
IPv6 Multicast: Bootstrap Router (BSR)	No	Yes
IPv6 Multicast: Explicit Tracking of Receivers	Yes	Yes
IPv6 Multicast: MLD Access Group	Yes	Yes
IPv6 Multicast: Multicast Listener Discovery (MLD) Protocol, Versions 1 and 2	Yes	Yes
IPv6 Multicast: PIM Accept Register	Yes	Yes
IPv6 Multicast: PIM Embedded RP Support	Yes	Yes
IPv6 Multicast: PIM Source-Specific Multicast (PIM-SSM)	Yes	Yes
IPv6 Multicast: PIM Sparse Mode (PIM-SM)	Yes	Yes
IPv6 Multicast: Routable Address Hello Option	Yes	Yes
IPv6 Multicast: RPF Flooding of Bootstrap Router (BSR) Packets	Yes	Yes
IPv6 Multicast: Scope Boundaries	Yes	Yes
IPv6 Neighbor Discovery	Yes	Yes
IPv6 Neighbor Discovery Duplicate Address Detection	Yes	Yes
IPv6 OSPFv3 NSF/SSO	Yes <sup>4</sup>	Yes
IPv6 OSPFv3 Fast Convergence	Yes	Yes
IPv6 Policy-Based Routing	No	Yes
IPv6 RA Guard (Host Mode)	Yes	Yes
IPv6 Routing - EIGRP Support	No	Yes
IPv6 Routing: OSPF for IPv6 (OSPFv3)	Yes <sup>4</sup>	Yes
IPv6 Routing: RIP for IPv6 (RIPng)	Yes	Yes
IPv6 Routing: Route Redistribution	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
IPv6 Routing: Static Routing	Yes	Yes
IPv6 Security: Secure Shell SSH support over IPv6	Yes	Yes
IPv6 Services: AAAA DNS Lookups over an IPv4 Transport	Yes	Yes
IPv6 Services: Cisco Discovery Protocol (CDP) - IPv6 Address Family Support for Neighbor Information	Yes	Yes
IPv6 Services: DNS Lookups over an IPv6 Transport	Yes	Yes
IPv6 Services: Extended Access Control Lists	Yes	Yes
IPv6 Services: Standard Access Control Lists	Yes	Yes
IPv6 Static Routing: Support for Tracking Objects	Yes	Yes
IPv6 Stateless Auto-configuration	Yes	Yes
IPv6 Switching: CEF Support	Yes	Yes
IPv6 Switching: CEFv6 Switched Automatic IPv4-compatible Tunnels (in software)	Yes	Yes
IPv6 Switching: CEFv6 Switched Configured IPv6 over IPv4 Tunnels (in software)	Yes	Yes
IPv6 Switching: CEFv6 Switched ISATAP Tunnels (in software)	Yes	Yes
IPv6 TCL	Yes	Yes
IPv6 Tunneling: Automatic 6to4 Tunnels (in software)	Yes	Yes
IPv6 Tunneling: Automatic IPv4-compatible Tunnels (in software)	Yes	Yes
IPv6 Tunneling: IPv6 over IPv4 GRE Tunnels (in software)	Yes	Yes
IPv6 Tunneling: ISATAP Tunnel Support (in software)	Yes	Yes
IPv6 Tunneling: Manually Configured IPv6 over IPv4 Tunnels (in software)	Yes	Yes
IPv6 Virtual LAN Access Control List (VACL)	Yes	Yes
IPsecv3/IKEv2 (for management traffic only)	Yes	Yes
IS-IS for IPv4 and IPv6	No	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
ISSU (IOS In-Service Software Upgrade)	Yes	Yes
Jumbo Frames	Yes	Yes
Layer 2 Control Packet	Yes	Yes
Layer 2 Protocol Tunneling (L2PT)	Yes	Yes
Layer 2 Traceroute	Yes	Yes
Layer 3 Multicast Routing (PIM SM, SSM, Bidir)	Yes	Yes
Link State Tracking	Yes	Yes
Loadsharing IP packets over more than six parallel paths	Yes	Yes
Local Proxy ARP	Yes	Yes
Location MIBs	Yes	Yes
MAB for Voice VLAN	Yes	Yes
MAB with Configurable User Name/Password	Yes	Yes
MAC Address Notification	Yes	Yes
MAC Authentication Bypass	Yes	Yes
MAC Move and Replace	Yes	Yes
Medianet 2.0: AutoQoS SRND4 Macro	Yes	Yes
Medianet 2.0: Integrated Video Traffic Simulator (hardware-assisted IP SLA); IPSLA generator and responder	Yes	Yes
Medianet 2.0: Flow Metadata	Yes	Yes
Medianet 2.0: Media Service Proxy	Yes	Yes
Medianet 2.0: Media Monitoring (Performance Monitoring and Mediatrace)	Yes	Yes
Memory Threshold Notifications	Yes	Yes
Microflow policers	Yes	Yes
Modular QoS CLI (MQC)	Yes	Yes
Multi-authentication and VLAN Assignment	Yes	Yes
Multi-VRF Support (VRF lite)	No	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
Multicast BGP (MBGP)	No	Yes
Multicast Fast Switching Performance Improvement	Yes	Yes
Multicast Routing Monitor (MRM)	Yes	Yes
Multicast Source Discovery Protocol (MSDP)	Yes	Yes
Multicast Subsecond Convergence	Yes	Yes
Multicast VLAN Registration (MVR)	Yes	Yes
NAC - L2 IEEE 802.1x	Yes	Yes
NAC - L2 IP	Yes	Yes
ND Cache Limit/Interface	Yes	Yes
NETCONF over SSHv2	Yes	Yes
Network Edge Access Topology (NEAT)	Yes	Yes
NEAT Enhancement: Re-Enabling BPDU Guard Based on User Configuration	Yes	Yes
Network Time Protocol (NTP)	Yes	Yes
Network Time Protocol (NTP) master	Yes	Yes
NMSP Enhancements <ul style="list-style-type: none"> <li>• GPS support for location</li> <li>• Location at switch level</li> <li>• Local timezone change</li> <li>• Name value pair</li> <li>• Priority settings for MIBs</li> </ul>	Yes	Yes
No Service Password Recovery	Yes	Yes
No. of VLAN Support	4096	4096
NSF - BGP	No	Yes
NSF - EIGRP	Yes	Yes
NSF - OSPF (version 2 only)	Yes	Yes
NSF - SSO	Yes	Yes
NTP for IPv6	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
NTP for VRF aware	No	Yes
Object Tracking: IPv6 Route Tracking	Yes	Yes
Onboard Failure Logging (OBFL)	Yes	Yes
Open Plug-N-Play Agent	Yes	Yes
OSPF	Yes <sup>4</sup>	Yes
OSPF v3 Authentication	Yes <sup>4</sup>	Yes
OSPF Flooding Reduction	Yes <sup>4</sup>	Yes
OSPF for Routed Access <sup>5</sup>	Yes	Yes
OSPF Incremental Shortest Path First (i-SPF) Support	Yes <sup>4</sup>	Yes
OSPF Link State Database Overload Protection	Yes <sup>4</sup>	Yes
OSPF Not-So-Stubby Areas (NSSA)	Yes <sup>4</sup>	Yes
OSPF Packet Pacing	Yes <sup>4</sup>	Yes
OSPF Shortest Paths First Throttling	Yes <sup>4</sup>	Yes
OSPF Stub Router Advertisement	Yes <sup>4</sup>	Yes
OSPF Support for Fast Hellos	Yes <sup>4</sup>	Yes
OSPF Support for Link State Advertisement (LSA) Throttling	Yes <sup>4</sup>	Yes
OSPF Support for Multi-VRF on CE Routers	Yes <sup>4</sup>	Yes
OSPF Update Packet-Pacing Configurable Timers	Yes <sup>4</sup>	Yes
Out-of-band Management Port	Yes	Yes
Out-of-band Management Port - IPv6	Yes	Yes
Per Intf IGMP State Limit	Yes	Yes
Per Intf MrouteState Limit	Yes	Yes
Per Port Per VLAN Policing	Yes	Yes
Per-User ACL Support for 802.1X/MAB/Webauth users	Yes	Yes
Per-VLAN Learning	Yes	Yes
Permanent Right-to-Use (PRTU) license	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
PIM Dense Mode State Refresh	Yes	Yes
PIM Multicast Scalability	Yes	Yes
PIM Version 1	Yes	Yes
PIM Version 2	Yes	Yes
PnP Agent	Yes	Yes
Port Security	Yes (supports 3072 MACs)	Yes (supports 3072 MACs)
Port Security on Etherchannel Trunk Port	Yes	Yes
Pragmatic General Multicast (PGM)	Yes	Yes
Priority Queueing (PQ)	Yes	Yes
Private VLAN Promiscuous Trunk Port	Yes	Yes
Private VLAN Trunk Ports	Yes	Yes
Private VLANs	Yes	Yes
Propagation of Location Info over CDP	Yes	Yes
PVLAN over EtherChannel	Yes	Yes
PVST + (Per VLAN Spanning Tree Plus)	Yes	Yes
Q-in-Q	Yes	Yes
QoS Packet Marking	Yes	Yes
QoS Priority Percentage CLI Support	Yes	Yes
RADIUS	Yes	Yes
RADIUS Attribute 44 (Accounting Session ID) in Access Requests	Yes	Yes
RADIUS Change of Authorization	Yes	Yes
Rapid PVST+ Dispute Mechanism	Yes	Yes
Rapid-Per-VLAN-Spanning Tree (Rapid-PVST)	Yes	Yes
Reduced MAC Address Usage	Yes	Yes
Redundancy Facility Protocol	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
Remote SPAN (RSPAN)	Yes	Yes
REP (Resilient Ethernet Protocol)	Yes	Yes
REP - No Edge Neighbour Enhancement	Yes	Yes
RIP v1	Yes	Yes
RMON events and alarms	Yes	Yes
Secure CDP	Yes	Yes
Secure Copy (SCP)	Yes	Yes
Secure Shell SSH Version 1 Integrated Client	Yes	Yes
Secure Shell SSH Version 1 Server Support	Yes	Yes
Secure Shell SSH Version 2 Client Support	Yes	Yes
Secure Shell SSH Version 2 Server Support	Yes	Yes
Security Group ACL at Interface Level	Yes	Yes
Single Rate 3-Color Marker for Traffic Policing	Yes	Yes
Smart Install Director—Configuration-only Deployment and Smooth Upgrade	Yes	Yes
Smart Port	Yes	Yes
SMI Catalyst 4K Client	Yes	Yes
SNMP (Simple Network Management Protocol)	Yes	Yes
SNMP Inform Request	Yes	Yes
SNMP Manager	Yes	Yes
SNMPv2C	Yes	Yes
SNMPv3 - 3DES and AES Encryption Support	Yes	Yes
SNMPv3 (SNMP Version 3)	Yes	Yes
Source Specific Multicast (SSM)	Yes	Yes
Source Specific Multicast (SSM) - IGMPv3,IGMP v3lite, and URD	Yes	Yes
Source Specific Multicast (SSM) Mapping	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
SPAN (# of sessions) – Port Mirroring	Yes (16 bidirectional sessions)	Yes (16 bidirectional sessions)
SPAN ACL Filtering for IPv6	Yes	Yes
Span Enhancement: Packet Type and Address Type Filtering	Yes	Yes
Spanning Tree Protocol (STP)	Yes	Yes
Spanning Tree Protocol (STP) - Backbone Fast Convergence	Yes	Yes
Spanning Tree Protocol (STP) - Loop Guard	Yes	Yes
Spanning Tree Protocol (STP) - Portfast	Yes	Yes
Spanning Tree Protocol (STP) - PortFast BPDU Filtering	Yes	Yes
Spanning Tree Protocol (STP) - Portfast BPDU Guard	Yes	Yes
Spanning Tree Protocol (STP) - Portfast Support for Trunks	Yes	Yes
Spanning Tree Protocol (STP) - Root Guard	Yes	Yes
Spanning Tree Protocol (STP) - Uplink Fast Convergence	Yes	Yes
Spanning Tree Protocol (STP) - Uplink Load Balancing	Yes	Yes
Spanning Tree Protocol (STP) Extension	Yes	Yes
Standard IP Access List Logging	Yes	Yes
Standby Supervisor Port Usage	Yes	Yes
Sticky Port Security	Yes	Yes
Sticky Port Security on Voice VLAN	Yes	Yes
Storm Control - Per-Port Multicast Suppression	Yes	Yes
STP Syslog Messages	Yes	Yes
Stub IP Multicast Routing	Yes	Yes
Sub-second UDLD	Yes	Yes
SVI (Switch Virtual Interface) Autostate Exclude	Yes	Yes
Switch and IP Phone Security Interaction	Yes	Yes



Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
Switch Port Analyzer (SPAN)	Yes	Yes
Switch Port Analyzer (SPAN) - CPU Source	Yes	Yes
Syslog over IPV6	Yes	Yes
System Logging - EAL4 Certification Enhancements	Yes	Yes
TACACS SENDAUTH function	Yes	Yes
TACACS Single Connection	Yes	Yes
TACACS+	Yes	Yes
TACACS+ and Radius for IPv6-	Yes	Yes
TCAM4 - Dynamic Multi-Protocol	Yes	Yes
TCAM4 - Service-Aware Resource Allocation	Yes	Yes
Time Domain Reflectometry (TDR)	Yes	Yes
Time-Based Access Lists	Yes	Yes
Time-Based Access Lists Using Time Ranges (ACL)	Yes	Yes
Trusted boundary (extended trust for CDP devices)	Yes	Yes
TrustSec: IEEE 802.1ae MACSec Layer 2 encryption	Yes	Yes
TrustSec: IEEE 802.1ae MACSec encryption on user facing ports	Yes	Yes
TrustSec: IEEE 802.1ae MACSec encryption between switch-to-switch links using Cisco SAP (Security Association Protocol)	Yes	Yes
TrustSec Critical Authentication	Yes	Yes
TrustSec SGT Exchange Protocol (SXP) IPv4	Yes	Yes
TrustSec SGT/ SGA	Yes	Yes
UDI - Unique Device Identifier	Yes	Yes
Uni-Directional Link Routing (UDLR)	Yes	Yes
Unicast Mac Filtering	Yes	Yes
Unicast Reverse Path Forwarding (uRPF)	Yes	Yes
Unidirectional Ethernet	Yes	Yes

Table 5 IP Base and Enterprise Services Image Support on Cisco Catalyst 4500-X Series

Feature	IP Base	Enterprise Services
UniDirectional Link Detection (UDLD)	Yes	Yes
Virtual Router Redundancy Protocol (VRRP) for IPv4	Yes	Yes
Virtual Switching System (VSS)	Yes	Yes
Virtual Switching System (VSS) Phase 2 <sup>6</sup> <ul style="list-style-type: none"> <li>Support for Layer 3 MEC—VSS with Layer 3 Multichassis EtherChannel (MEC) at the aggregation layer</li> <li>Support for VSLP Fast Hello—With VSLP Fast Hello, the Catalyst 4500-X configured for VSS can now connect Access Switches that do not support the ePAgP protocol.</li> <li>Support for VSL Encryption</li> </ul>	Yes	Yes
Virtual Trunking Protocol (VTP) - Pruning	Yes	Yes
VLAN Access Control List (VACL)	Yes	Yes
VLAN MAC Address Filtering	Yes	Yes
VLAN Mapping (VLAN Translation)	Yes	Yes
VRF-aware TACACS+	No	Yes
VRF-lite for IPv6 on OSPF/ BGP/ EIGRP	No	Yes
VRRPv3: Object Tracking Integration	Yes	Yes
VRRPv3 Protocol Support	Yes	Yes
VTP (Virtual Trunking Protocol) Version 2	Yes	Yes
VTP Version 3	Yes	Yes
WCCP Version 2	Yes	Yes
Web Authentication Proxy	Yes	Yes
Web Authentication Redirection to Original URL	Yes	Yes
Webauth Enhancements	Yes	Yes
Wireshark-based Ethernet Analyzer	Yes	Yes
XML-PI	Yes	Yes

1. Catalyst 4500-X, Supervisor Engine 7-E, and Supervisor Engine 8-E; IP Base. Supervisor Engine 7L-Ent Services.
2. IEEE 802.1t—An IEEE amendment to IEEE 802.1D that includes extended system ID, long path cost, and PortFast.

3. When either Source or Prefix Guard for IPv6 is enabled, ICMPv6 packets are unrestricted on all Catalyst 4500 series switch platforms running IOS Cisco Release 15.2(1)E. All other traffic types are restricted.
4. IP Base supports only one OSPFv2 and one OSPFv3 instance with a maximum number of 1000 dynamically learned routes.
5. OSPF for Routed Access supports only one OSPFv2 and one OSPFv3 instance with a maximum number of 1000 dynamically learned routes
6. As of IOS Release 3.5.0E, VSS supports Smart Install Director—Zero Touch installation without any convergence down-time.

## MIB Support

For information on MIB support, please refer to this URL:

<ftp://ftp.cisco.com/pub/mibs/supportlists/cat4000/cat4000-supportlist.html>

## Features Not Supported on the Cisco Catalyst 4500-X Series Switches

The following features are not supported on a Catalyst 4500-X Series switches:

- CISCO-IETF-IP-FORWARD-MIB
- CISCO-IETF-IP-MIB
- LLDP HA
- SMI Proxy
- SSO
- WCCP Version 1
- **isis network point-to-point** command

With some exceptions, the VSS maintains “feature parity” with the standalone Catalyst 4500 or 4500-X series switches. Major exceptions include:

- CFM D8.1
- Dot1q Tunnel (“**legacy/classic**” dot1q tunnel)
- Dot1q tunneling and L2PT (Layer 2 Protocol Tunneling)
- Fast UDLD
- Flexlink
- Mediatrace (Medianet active video monitoring feature)
- Metadata (Medianet feature)
- Per VLAN Learning
- REP and associated featurettes
- UDE
- UDLR
- VLAN Translation (1:1 and 1:2-Selective QinQ)
- VMPS Client
- WCCP

## Orderable Product Numbers

*Table 6 Cisco IOS XE Software Release 3.6.0E Product Numbers and Images for the Catalyst 4500-X Series Switches*

Product Number	Description	Image
<b>Base Switch PIDs</b>		
WS-C4500X-32SFP+	Catalyst 4500-X 32 Port 10GE IP Base, Front-to-Back Cooling i.e. Port Side to Power Supply Cooling with no Power Supply	cat4500e-universal.SPA.03.04.00.SG.151-2.SG.bin cat4500e-universalk9.SPA.03.04.00.SG.151-2.SG.bin
WS-C4500X-F-32SFP+	Catalyst 4500-X 32 Port 10GE IP Base, Back-to-Front Cooling i.e. Power Supply to Port Side Cooling with no Power Supply	cat4500e-universal.SPA.03.04.00.SG.151-2.SG.bin cat4500e-universalk9.SPA.03.04.00.SG.151-2.SG.bin
WS-C4500X-16SFP+	Catalyst 4500-X 16 Port 10GE IP Base, Front-to-Back Cooling i.e. Port Side to Power Supply Cooling with no Power Supply	cat4500e-universal.SPA.03.04.00.SG.151-2.SG.bin cat4500e-universalk9.SPA.03.04.00.SG.151-2.SG.bin
WS-C4500X-F-16SFP+	Catalyst 4500-X 16 Port 10GE IP Base, Back-to-Front Cooling i.e. Power Supply to Port Side Cooling with no Power Supply	cat4500e-universal.SPA.03.04.00.SG.151-2.SG.bin cat4500e-universalk9.SPA.03.04.00.SG.151-2.SG.bin
WS-C4500X-24X-IPB	Catalyst 4500-X 24 Port 10GE IP Base, Front-to-Back Cooling (Power Supplies must be configured)	cat4500e-universal.SPA.03.04.00.SG.151-2.SG.bin cat4500e-universalk9.SPA.03.04.00.SG.151-2.SG.bin
WS-C4500X-40X-ES	Catalyst 4500-X 40 Port 10G Enterprise Services, Front-to-Back Cooling, No Power Supply	cat4500e-universal.SPA.03.04.00.SG.151-2.SG.bin cat4500e-universalk9.SPA.03.04.00.SG.151-2.SG.bin
WS-C4500X-24X-ES	Catalyst 4500-X 24 Port 10G Enterprise Services, Front-to-Back Cooling, No Power Supply	cat4500e-universal.SPA.03.04.00.SG.151-2.SG.bin cat4500e-universalk9.SPA.03.04.00.SG.151-2.SG.bin
<b>FRU and OIR FANs</b>		
C4KX-FAN-F	Catalyst 4500-X Back-to-Front Cooling Fan	NA
C4KX-FAN-R	Catalyst 4500-X Front-to-Back Cooling Fan	NA
<b>Power Supply</b>		

**Table 6** Cisco IOS XE Software Release 3.6.0E Product Numbers and Images for the Catalyst 4500-X Series Switches

Product Number	Description	Image
C4KX-PWR-750AC-F	Catalyst 4500-X 750W AC Back-to-Front Cooling Power Supply (primary)	N/A
C4KX-PWR-750AC-F/2	Catalyst 4500-X 750W AC Back-to-Front Cooling Power Supply (secondary)	N/A
C4KX-PWR-750AC-R	Catalyst 4500-X 750W AC Front-to-Back Cooling Power Supply (primary)	N/A
C4KX-PWR-750AC-R/2	Catalyst 4500-X 750W AC Front-to-Back Cooling Power Supply (secondary)	N/A
C4KX-PWR-750DC-F	Catalyst 4500-X 750W DC Back-to-Front Cooling Power Supply (primary)	N/A
C4KX-PWR-750DC-F/2	Catalyst 4500-X 750W DC Back-to-Front Cooling Power Supply (secondary)	N/A
C4KX-PWR-750DC-R	Catalyst 4500-X 750W DC Front-to-Back Cooling Power Supply (primary)	N/A
C4KX-PWR-750DC-R/2	Catalyst 4500-X 750W DC Front-to-Back Cooling Power Supply (secondary)	N/A
<b>Accessories</b>		
CAB-CON-C4K-RJ45	Console Cable 6ft with RJ-45-to-RJ-45	N/A
SD-X45-2GB-E	Cisco Catalyst 4500 2-GB SD card	N/A
USB-X45-4GB-E	Cisco Catalyst 4500 4-GB USB device	N/A
C4KX-NM-8SFP+	Catalyst 4500-X 8 Port 10GE Network Module	N/A
<b>Software</b>		
S45XU-35-1521E	CAT4500-X Universal Image	cat4500e-universal.SPA.03.05.00.E.152-1E.bin
S45XUK9-35-1521E	CAT4500-X Universal Crypto image	cat4500e-universalk9.SPA.03.05.00.E.152-1.E.bin

# New and Changed Information

These sections describe the new and changed information for the Catalyst 4500-X Series switch running Cisco IOS XE software:

- [New Software Features in Release IOS XE 3.6.8E, page 30](#)
- [New Software Features in Release IOS XE 3.6.7E, page 30](#)
- [New Software Features in Release IOS XE 3.6.6E, page 30](#)
- [New Software Features in Release IOS XE 3.6.1E, page 31](#)
- [New Hardware Features in Release IOS XE 3.6.0E, page 31](#)
- [New Software Features in Release IOS XE 3.6.0E, page 31](#)

## New Software Features in Release IOS XE 3.6.8E

There are no new features in this release.

## New Software Features in Release IOS XE 3.6.7E

There are no new features in this release.

## New Software Features in Release IOS XE 3.6.6E

There are no new features in this release.

## New Software Features in Release IOS XE 3.6.5aE

There are no new features in this release.

## New Software Features in Release IOS XE 3.6.5E

There are no new features in this release.

## New Software Features in Release IOS XE 3.6.4E

There are no new features in this release.

## New Software Features in Release IOS XE 3.6.3E

The following table lists the new features for Release IOS XE 3.6.3E.

Feature Name	Description
CDP Bypass	<p>Authentication sessions are established in single and multi-host modes for IP Phones. However, if voice VLAN and 802.1x on an interface port is enabled, then CDP Bypass is enabled when the host mode is set to single or multi-host mode.</p> <p><b>Note</b> By default the host mode is set to single mode in legacy mode and multi-authentication in the eedge mode.</p> <p>Use the following commands to configure CDP bypass:</p> <pre>Switch&gt; enable Switch# configure terminal Switch(config)# interface interface-id Switch(config-if)# switchport mode access Switch(config-if)# switchport voice vlan vlan-id Switch(config-if)# authentication port-control auto Switch(config-if)# authentication host-mode {single   multi-host} Switch(config-if)# dot1x pae authenticator</pre> <p>(IP Base and Enterprise Services)</p>
Flexible NetFlow - CTS Fields	<p>Support for Cisco TrustSec (CTS) fields, to monitor and troubleshoot the CTS network, and to segregate traffic based on source group tag (SGT) values.</p> <p>(IP Base and Enterprise Services)</p>

## New Software Features in Release IOS XE 3.6.1E

The following table lists the new features for Release IOS XE 3.6.1E.

Feature Name	Description
Device Sensor	(LAN Base)
Policy Based Routing (PBR)	(IP Base)

## New Hardware Features in Release IOS XE 3.6.0E

Feature Name	Description
Passive CX1 assemblies	SFP-H10GB-CU1-5M, SFP-H10GB-CU2M, SFP-H10GB-CU2-5M
Active CX1 cable assemblies	SFP-H10GB-ACU7M, SFP-H10GB-ACU10M
Breakout cable on the 10 GbEnd	Support for QSFP-4SFP10G-CU1M, QSFP-4SFP10G-CU3M, QSFP-4SFP10G-CU5M
Cisco SFP+ Active Optical Cables	Support for Cisco SFP-10G-AOC1M Cisco SFP-10G-AOC2M Cisco SFP-10G-AOC3M, Cisco SFP-10G-AOC5M, Cisco SFP-10G-AOC7M, Cisco SFP-10G-AOC10M

## New Software Features in Release IOS XE 3.6.0E

The following table list the new features for Release IOS XE 3.6.0E.

Feature Name	Description
<p>Use this URL for the Cisco IOS XE Release 3E Documentation Roadmap</p> <p>Use this URL for the Cisco IOS Release 15E Documentation Roadmap</p>	<p>Provides quick and easy access to all relevant documentation for specific platforms. Look for <i>Quick Links to Platform Documentation</i> on the respective platform documentation pages.</p> <p>: <a href="http://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-xe-3e/tsd-products-support-series-home.html">http://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-xe-3e/tsd-products-support-series-home.html</a></p> <p>: <a href="http://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-15-2e/tsd-products-support-series-home.html">http://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-15-2e/tsd-products-support-series-home.html</a></p>
Auto Conf	Determines the level of network access provided to an endpoint based on the type of the endpoint device. This feature also permits hardbinding between the end device and the interface. Auto configuration falls under the umbrella of the Smart Operations solution.
Auto Security	Provides a single line CLI, to enable base line security features (Port Security, DHCP snooping, DAI).
Banner Page and Inactivity timeout for HTTP/S connections	Banner Page and Inactivity timeout for HTTP/S connections—Allows you to create a banner page and set an inactivity timeout for HTTP or HTTP Secure (HTTPS) connections. The banner page allows you to logon to the server when the session is invalid or expired.
Bidirectional SXP Support	Enhances the functionality of Cisco TrustSec with SXP version 4 by adding support for Security Group Tag (SGT) Exchange Protocol (SXP) bindings that can be propagated in both directions between a speaker and a listener over a single connection.
DHCP Gleaning	This is a read-only DHCP functionality that allows components to register and glean DHCP packets.
Easy VSS	Enables you to configure VSS with a single command on the active switch and no action on the VSS standby switch.
FIPS/CC Compliance for NMSP	The NMSP Strong Cipher enhancement enables strong ciphers for new NMSP connections. The existing NMSP connections will use the default cipher.
FQDN ACL	Helps to resolve the destination domain name to an IP address, which is provided to the client as a part of the domain name system (DNS) response.
Gateway Load Balancing Protocol	Protects data traffic from a failed router or circuit while allowing packet load sharing between a group of redundant routers.
HSRP: Global IPv6 Address	Allows users to configure multiple non-link local addresses as virtual addresses. The Hot Standby Router Protocol (HSRP) ensures host-to-router resilience and failover, in case the path between a host and the first-hop router fails, or the first-hop router itself fails.
Interface Templates	Provides a mechanism to configure multiple commands at the same time and associate it with a target such as an interface. An interface template is a container of configurations or policies that can be applied to specific ports.
IPv6 PBR	Allows you to manually configure how the received packets should be routed. PBR allows you to identify packets by using several attributes and to specify the next hop or the output interface to which the packet should be sent.
IPv6 Static Routing: Support for Tracking Objects	Allows an IPv6 Static Route to be associated with a tracked-object.



Feature Name	Description
MediaTrace 1.0	Provides the capability to diagnose Media Stream on top of various instrumentations in Cisco routers/switches and endpoints. Also addresses the MediaNet Video monitoring requirement to discover the signaling path and provides end-to-end diagnostics along the media stream routes.
Object Tracking: IPv6 Route Tracking	Expands the Enhanced Object Tracking (EOT) functionality to allow the tracking of IP version 6 (IPv6) routes.
Open Plug-N-Play Agent	Switch based agent support for zero touch automated device installation solution called NG-PNP.
Secure CDP	Allows users to select the type, length, value (TLV) fields that are sent on a particular interface to filter information sent through Cisco Discovery Protocol packets.
Security Group ACL at Interface Level	Controls and manages the Cisco TrustSec access control on a network device based on an attribute-based access control list. When a security group access control list (SGACL) is enabled globally, the SGACL is enabled on all interfaces in the network by default; use Security Group ACL at Interface Level feature to disable the SGACL on a Layer 3 interface.
SMI Catalyst 4K Client	Enables a Catalyst 4k standalone switch acting as Smart Install Client. <b>Note</b> SMI Proxy is not supported.
TrustSec Critical Authentication	Ensures that the Network Device Admission Control (NDAC)-authenticated 802.1X links between Cisco TrustSec devices are in open state even when the Authentication, Authorization, and Accounting (AAA) server is not reachable.
VRRPv3: Object Tracking Integration	Allows you to track the behavior of an object and receive notifications of changes. This feature explains how object tracking, in particular the tracking of IPv6 objects, is integrated into VRRP version 3 (VRRPv3) and describes how to track an IPv6 object using a VRRPv3 group.
VRRPv3 Protocol Support	Enables a group of routers to form a single virtual router to provide redundancy. This feature also provides the capability to support IPv4 and IPv6 addresses.
Web Authentication Redirection to Original URL	Enables networks to redirect guest users to the URL they had originally requested. This feature is enabled by default and requires no configuration.

## New and Modified IOS Software Features Supported in Cisco IOS XE 3.6.0E

The following new and modified software features are supported in Cisco IOS XE Release 3.6.0E.

### New Features:

#### **eEdge integration with MACSEC**

<http://www.cisco.com/en/US/docs/ios-xml/ios/san/configuration/15-e/san-macsec.html>

#### **DHCP Gleaning**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr\\_dhcp/configuration/15-e/dhcp-gleaning.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr_dhcp/configuration/15-e/dhcp-gleaning.html)

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr\\_dhcp/configuration/xr-3e/dhcp-xe-3e-book.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr_dhcp/configuration/xr-3e/dhcp-xe-3e-book.html)

#### **Service Discovery Gateway**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr\\_dns/configuration/15-e/dns-15-e-book.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr_dns/configuration/15-e/dns-15-e-book.html)

### **802.1X support for trunk ports**

[http://www.cisco.com/en/US/docs/ios-xml/ios/sec\\_usr\\_8021x/configuration/15-e/config-ieee-802x-pba.html](http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_8021x/configuration/15-e/config-ieee-802x-pba.html)

[http://www.cisco.com/en/US/docs/ios-xml/ios/sec\\_usr\\_8021x/configuration/xen-3e/sec-usr-8021x-xe-3e-book.html](http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_8021x/configuration/xen-3e/sec-usr-8021x-xe-3e-book.html)

### **Enhancements/Respins:**

#### **Commented IP Access List Entries**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-acl-comm-ipacl.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-acl-comm-ipacl.html)

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/xen-3e/sec-acl-comm-ipacl.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/xen-3e/sec-acl-comm-ipacl.html)

#### **IPv6 ACL Extensions for Hop by Hop Filtering**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/ip6-acl-ext-hbh.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/ip6-acl-ext-hbh.html)

#### **ACL Sequence Numbering**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-acl-seq-num.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-acl-seq-num.html)

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/xen-3e/sec-acl-seq-num.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/xen-3e/sec-acl-seq-num.html)

#### **ACL Support for Filtering IP Options**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-acl-support-filter-ip-option.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-acl-support-filter-ip-option.html)

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/xen-3e/sec-acl-support-filter-ip-option.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/xen-3e/sec-acl-support-filter-ip-option.html)

#### **ACL - TCP Flags Filtering**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-create-filter-tcp.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-create-filter-tcp.html)

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/xen-3e/sec-create-filter-tcp.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/xen-3e/sec-create-filter-tcp.html)

#### **ACL - Named ACL Support for Noncontiguous Ports on an Access Control Entry**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-named-acl-support-for-non-contiguous-ports.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-named-acl-support-for-non-contiguous-ports.html)

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/xen-3e/sec-named-acl-support-for-non-contiguous-ports.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/xen-3e/sec-named-acl-support-for-non-contiguous-ports.html)

#### **IP Access List Entry Sequence Numbering**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-acl-seq-num.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-acl-seq-num.html)

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/xe-3e/sec-acl-seq-num.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/xe-3e/sec-acl-seq-num.html)

### **IOS ACL Support for filtering IP Options**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-acl-support-filter-ip-option.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-acl-support-filter-ip-option.html)

### **ACL syslog Correlation**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-acl-syslog.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-acl-syslog.html)

### **IP Named Access Control List**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/sec-acl-named.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/sec-acl-named.html)

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/xe-3e/sec-acl-named.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/xe-3e/sec-acl-named.html)

### **IPv6 PACL support**

[http://cisco.com/en/US/docs/ios-xml/ios/sec\\_data\\_acl/configuration/15-e/ip6-pacl-supp.html](http://cisco.com/en/US/docs/ios-xml/ios/sec_data_acl/configuration/15-e/ip6-pacl-supp.html)

### **Cisco Data Collection Manager**

<http://www.cisco.com/en/US/docs/ios-xml/ios/bsdcm/configuration/15-e/bsdcm-15-e-book.html>

### **SNMPv3 Community MIB Support**

<http://www.cisco.com/en/US/docs/ios-xml/ios/snmp/configuration/15-e/snmp-15-e-book.html>

<http://www.cisco.com/en/US/docs/ios-xml/ios/snmp/configuration/xe-3e/snmp-xe-3e-book.html>

### **NETCONF XML PI**

<http://www.cisco.com/en/US/docs/ios-xml/ios/cns/configuration/15-e/cns-15-e-book.html>

### **IPv6 PIM Passive**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipmulti\\_pim/configuration/15-e/ip6-mcast-pim-pass.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipmulti_pim/configuration/15-e/ip6-mcast-pim-pass.html)

### **HSRP aware PIM**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipmulti\\_pim/configuration/15-e/imc\\_hsrp\\_aware.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipmulti_pim/configuration/15-e/imc_hsrp_aware.html)

### **OSPFv3 ABR Type 3 LSA Filtering**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/iro-abr-type-3.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/iro-abr-type-3.html)

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/iro-ospfv3-dc-ignore.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/iro-ospfv3-dc-ignore.html)

### **Graceful Shutdown Support for OSPFv3**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/iro-ospfv3-gshutdown.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/iro-ospfv3-gshutdown.html)

### **OSPF Support for BFD over IPv4**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_bfd/configuration/15-e/irbfd-bfd-ospf-ipv4-supp.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bfd/configuration/15-e/irbfd-bfd-ospf-ipv4-supp.html)

### **BFD - VRF Support**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_bfd/configuration/15-e/irbfd-vrf-supp.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bfd/configuration/15-e/irbfd-vrf-supp.html)

### **BFD - Static Route Support**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_bfd/configuration/15-e/irbfd-bfd-static-route-supp.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bfd/configuration/15-e/irbfd-bfd-static-route-supp.html)

### **Static Route Support for BFD over IPv6**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_bfd/configuration/15-e/ip6-bfd-static.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bfd/configuration/15-e/ip6-bfd-static.html)

### **BFD - EIGRP Support**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_bfd/configuration/15-e/irbfd-bfd-eigrp-supp.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bfd/configuration/15-e/irbfd-bfd-eigrp-supp.html)

### **OSPFv3 BFD**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_bfd/configuration/15-e/ip6-route-bfd-ospfv3.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bfd/configuration/15-e/ip6-route-bfd-ospfv3.html)

### **TACACS+ Per VRF**

[http://www.cisco.com/en/US/docs/ios-xml/ios/sec\\_usr\\_tacacs/configuration/15-e/sec-usr-tacacs-15-e-book.html](http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_tacacs/configuration/15-e/sec-usr-tacacs-15-e-book.html)

### **SSHv2 Enhancements**

[http://www.cisco.com/en/US/docs/ios-xml/ios/sec\\_usr\\_ssh/configuration/15-e/sec-secure-shell-v2.html](http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_ssh/configuration/15-e/sec-secure-shell-v2.html)

### **Client Information Signalling Protocol (CISP)**

[http://www.cisco.com/en/US/docs/ios-xml/ios/sec\\_usr\\_8021x/configuration/15-e/sec-ieee-neat.html](http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_8021x/configuration/15-e/sec-ieee-neat.html)

### **OSPFv3 MIB**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/iro-ospfv3-mib.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/iro-ospfv3-mib.html)

### **\OSPFv3 Max-Metric Router-Lsa**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/ip6-route-ospfv3-max-lsa.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/ip6-route-ospfv3-max-lsa.html)

### **OSPFv3 VRF-Lite/PE-CE**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/iro-vrf-lite-pe-ce.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/iro-vrf-lite-pe-ce.html)

### **VRRPv3 Protocol Support**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp\\_fhrp/configuration/15-e/fhp-15-e-book\\_chapter\\_0100.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp_fhrp/configuration/15-e/fhp-15-e-book_chapter_0100.html)

#### **IPv6 Source/Prefix Guard**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6\\_fhsec/configuration/15-e/ip6f-15-e-book\\_chapter\\_0110.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6_fhsec/configuration/15-e/ip6f-15-e-book_chapter_0110.html)

#### **IPv6 Router Advertisement Throttler**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6\\_fhsec/configuration/15-e/ip6f-15-e-book\\_chapter\\_0111.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6_fhsec/configuration/15-e/ip6f-15-e-book_chapter_0111.html)

#### **IPv6 Neighbor Discovery Multicast Suppress**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6\\_fhsec/configuration/15-e/ip6-nd-mcast-supp.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6_fhsec/configuration/15-e/ip6-nd-mcast-supp.html)

#### **IPv6 Destination Guard**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6\\_fhsec/configuration/15-e/ipv6-dest-guard.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6_fhsec/configuration/15-e/ipv6-dest-guard.html)

#### **DHCPv6 Relay - Lightweight DHCPv6 Relay Agent**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr\\_dhcp/configuration/15-e/dhcp-ldra.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr_dhcp/configuration/15-e/dhcp-ldra.html)

#### **DNS - VRF aware DNS**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr\\_dns/configuration/15-e/dns-15-e-book\\_chapter\\_01.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr_dns/configuration/15-e/dns-15-e-book_chapter_01.html)

#### **DHCPv6 - Relay chaining for Prefix Delegation**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr\\_dhcp/configuration/15-e/dhcp-15e-book\\_chapter\\_010.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr_dhcp/configuration/15-e/dhcp-15e-book_chapter_010.html)

#### **OSPFv3 Retransmission Limits**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/command/ospf-i1.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/command/ospf-i1.html)

#### **OSPFv3 RFC 3101 Support**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/iro-ospfv3-nssa-cfg.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/iro-ospfv3-nssa-cfg.html)

#### **OSPF support for NSSA RFC 3101**

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_ospf/configuration/15-e/iro-ospfv2-nssa-cfg.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/15-e/iro-ospfv2-nssa-cfg.html)

#### **TFTP IPv6 support**

[http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6\\_nman/configuration/15-e/ip6-tftp-supp.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6_nman/configuration/15-e/ip6-tftp-supp.html)

#### **Capabilities Manager**

<http://www.cisco.com/en/US/docs/ios-xml/ios/saf/configuration/15-e/saf-capman.html>

### Extensible Messaging Client Protocol (XMCP) 2.0

<http://www.cisco.com/en/US/docs/ios-xml/ios/saf/configuration/15-e/saf-xmcp.html>

## Cisco IOS XE to Cisco IOS Version Number Mapping

As [Table 7](#) shows, each version of Cisco IOS XE has an associated Cisco IOS version:

*Table 7 Cisco IOS XE to Cisco IOS Version Number Mapping*

Cisco IOS XE Version	Cisco IOS Version
03.3.0SG	15.1(1)SG
03.3.1SG	15.1(1)SG1
03.4.0SG	15.1(2)SG
03.5.0E	15.2(1)E
03.6.0E	15.2(2)E

## Upgrading the System Software

- Before upgrading to Cisco IOS XE Release 3.6.6E, you need to upgrade the Prime Infrastructure software to Release 3.1.4 with Device Pack(DP) 6.
- If you are upgrading to IOS XE Version 3.6.0E and plan to use VSS, you must upgrade your ROMMON to IOS Version 15.0(1r)SG10.
- ISSU is supported on 4500X in VSS configuration.
- If dual supervisor engines are present, first upgrade your software to Cisco IOS XE 3.2.0SG or later, then upgrade your ROMMON to IOS Version 15.0(1r)SG7 to avoid an uplinks issue (CSCtj54375).

## Limitations and Restrictions

- Although the show memory command is supported on Catalyst 4500 series switches, the CLI output for the command shows the value 0 for the config total, on Catalyst 4500 series switches using a daughter card on Supervisor Engine 7-E. This issue is, however, not seen on switches with Supervisor Engine 7-E baseboard. (CSCup28930)
- Starting with Release IOS XE 3.3.0SG, the seven RP restriction was removed.
- We recommend that you configure the **access-session interface-template sticky timer timer-value** command at the global or interface configuration mode, and not within the template.
- Performing an ISSU from a prior release to IOS XE 3.6.0E is not supported.
- More than 16K QoS policies can be configured in software. Only the first 16K are installed in hardware.

- Adjacency learning (through ARP response frames) is restricted to roughly 1000 new adjacencies per second, depending on CPU utilization. This should only impact large networks on the first bootup. After adjacencies are learned they are installed in hardware.
- Multicast fastdrop entries are not created when RPF failure occurs with IPv6 multicast traffic. In a topology where reverse path check failure occurs with IPv6 multicast, this may cause high CPU utilization on the switch.
- The SNMP ceImageFeature object returns a similar feature list for all the three license levels (IP Base and EntServices). Although the activated feature set for a universal image varies based on the installed feature license, the value displayed by this object is fixed and is not based on the feature license level.
- Standard TFTP implementation limits the maximum size of a file that can be transferred to 32 MB. If ROMMON is used to boot an IOS image that is larger than 32 MB, the TFTP transfer fails at the 65,xxx datagram.

TFTP numbers its datagrams with a 16 bit field, resulting in a maximum of 65,536 datagrams. Because each TFTP datagram is 512 bytes long, the maximum transferable file is  $65536 \times 512 = 32$  MB. If both the TFTP client (ROMMON) and the TFTP server support block number wraparound, no size limitation exists.

Cisco has modified the TFTP client to support block number wraparound. So, if you encounter a transfer failure, use a TFTP server that supports TFTP block number wraparound. Because most implementations of TFTP support block number wraparound, updating the TFTP daemon should fix the issue.

- A XML-PI specification file entry does not return the desired CLI output.

The outputs of certain commands, such as **show ip route** and **show access-lists**, contain non-deterministic text. While the output is easily understood, the output text does not contain strings that are consistently output. A general purpose specification file entry is unable to parse all possible output.

#### Workaround (1):

While a general purpose specification file entry may not be possible, a specification file entry might be created that returns the desired text by searching for text that is guaranteed to be in the output. If a string is guaranteed to be in the output, it can be used for parsing.

For example, the output of the `show ip access-lists SecWiz_Gi3_17_out_ip` command is this:

```
Extended IP access list SecWiz_Gi3_17_out_ip
 10 deny ip 76.0.0.0 0.255.255.255 host 65.65.66.67
 20 deny ip 76.0.0.0 0.255.255.255 host 44.45.46.47
 30 permit ip 76.0.0.0 0.255.255.255 host 55.56.57.57
```

The first line is easily parsed because access list is guaranteed to be in the output:

```
<Property name="access list" alias="Name" distance="1.0" length="-1" type="String" />
```

The remaining lines all contain the term host. As a result, the specification file may report the desired values by specifying that string. For example, this line

```
<Property name="host" alias="rule" distance="s.1" length="1" type="String" />
```

will produce the following for the first and second rules

```
<rule>
  deny
</rule>
```

and the following for the third statement

```
<rule>
  permit
</rule>
```

**Workaround (2):**

Request the output of the **show running-config** command using NETCONF and parse that output for the desired strings. This is useful when the desired lines contain nothing in common. For example, the rules in this access list do not contain a common string and the order (three permits, then a deny, then another permit), prevent the spec file entry from using permit as a search string, as in the following example:

```
Extended MAC access list MACCOY
  permit 0000.0000.ffef ffff.ffff.0000 0000.00af.bcef ffff.ff00.0000 appletalk
  permit any host 65de.edfe.fefe xns-idp
  permit any any protocol-family rarp-non-ipv4
  deny host 005e.1e5d.9f7d host 3399.e3e1.ff2c dec-spanning
  permit any any
```

The XML output of **show running-config** command includes the following, which can then be parsed programmatically, as desired:

```
<mac><access-list><extended><ACLName>MACCOY</ACLName></extended></access-list></mac>
  <X-Interface> permit 0000.0000.ffef ffff.ffff.0000 0000.00af.bcef ffff.ff00.0000
  appletalk</X-Interface>
  <X-Interface> permit any host 65de.edfe.fefe xns-idp</X-Interface>
  <X-Interface> permit any any protocol-family rarp-non-ipv4</X-Interface>
  <X-Interface> deny host 005e.1e5d.9f7d host 3399.e3e1.ff2c
  dec-spanning</X-Interface>
  <X-Interface> permit any any</X-Interface>
```

**CSCtg93278**

- When attaching an existing policy-map (that is already applied to a control-port) to another front-panel port, the following message displays:

```
The policymap <policy-map name> is already attached to control-plane and cannot be
shared with other targets.
```

**Workaround:** Define a policy-map with a different name and then reattach. CSCti26172

- If the number of unique FNF monitors attached to target exceeds 2048 (one per target), a switch responds slowly:

**Workarounds:**

- Decrease the number of monitors.
- Attach the same monitor to multiple targets. CSCti43798

- **ciscoFlashPartitionFileCount** object returns an incorrect file count for **bootflash:**, **usb0:**, **slot0:**, **slaveslot0:**, **slavebootflash:**, and **slaveusb0:**.

**Workaround:** Use the **dir device** command (for example, **dir bootflash:**) to obtain the correct file count. CSCti74130

- If multicast is configured and you make changes to the configuration, Traceback and CPUHOG messages are displayed if the following conditions exist:
  - At least 10K groups and roughly 20K mroutes exist.
  - IGMP joins with source traffic transit to all the multicast groups.



This is caused by the large number of updates generating SPI messages that must be processed by the CPU to ensure that the platform is updated with the changes in all the entries.

**Workaround:** None. CSCti20312

- With traffic running, entering **clear ip mroute \*** with larger number of mroutes and over 6 OIFs will cause Malloc Fail messages to display.

You cannot clear a large number of mroutes at one time when traffic is still running.

**Workaround:** Do not clear all mroutes at once.

CSCtn06753

- Although you can configure subsecond PIM query intervals on Catalyst 4500 platforms, such an action represents a compromise between convergence (reaction time) and a number of other factors (number of mroutes, base line of CPU utilization, CPU speed, processing overhead per 1 m-route, etc.). You must account for those factors when configuring subsecond PIM timers. We recommend that you set the PIM query interval to a minimum of 2 seconds. By adjusting the available parameters, you can achieve flawless operation; that is, a top number of multicast routes per given convergence time on a specific setup.
- Energywise WOL is not “waking up” a PC in hibernate or standby mode.

**Workaround:** None. CSCtr51014

- When OSPFv3 LSA throttling is configured, rate limiting does not take effect for a few minutes.

**Workaround:** None. CSCtw86319

- The ROMMON version number column in the output of **show module** command is truncated.

**Workaround:** Use the **show version** command. CSCtr30294

- IP SLA session creation fails randomly for various 4-tuples.

**Workaround:** Select an alternate destination or source port. CSCty05405

- The system cannot scale to greater than 512 SIP flows with MSP and metadata enabled.

**Workaround:** None. CSCty79236

- When either the RADIUS-server test feature is enabled or RADIUS-server dead-criteria is configured, and either RADIUS-server deadtime is set to 0 or not configured, the RADIUS-server status is not properly relayed to AAA.

**Workaround:** Configure both dead-criteria and deadtime.

```
radius-server dead-criteria
radius-server deadtime
```

CSCtl06706

- If you use the **quick** option in the **issu changeversion** command, the following might occur:
  - Links flap for various Layer 3 protocols.
  - A traffic loss of several seconds is observed during the upgrade process.

**Workaround:** Do not use the **quick** option with the **issu changeversion** command. CSCto51562

- While configuring an IPv6 access-list, if you specify **hardware statistics** as the first statement in v6 access-list mode (i.e. before issuing any other v6 ACE statement), it will not take effect. Similarly, your hardware statistics configuration will be missing from the output of the **show running** command.

You will not experience this behavior with IPv4 access lists.

**Workaround:** During IPv6 access-list configuration, configure at least one IPv6 ACE before the "hardware statistics" statement. CSCuc53234

- Routed packets that are fragmented are not policed if the egress interface is on the VSS Standby switch. However, if the egress interface is on the VSS active switch, these packets are policed.

This applies to QoS policing only. QoS marking, shaping and sharing behave as expected.

**Workaround:** None. CSCub14402

- When an IPv6 FHS policy is applied on a VLAN and an EtherChannel port is part of that VLAN, packets received by EtherChannel (from neighbors) are not bridged across the local switch.

**Workaround:** Apply FHS policies on a non EtherChannel port rather than a VLAN. CSCua53148

- During VSS conversion, the switch intended as the Standby device may require up to 9 minutes to reach an SSO state. The boot up time depends on the configuration and on the number of line cards in the system.

**Workaround:** None. CSCua87538

- An incorrect module number is displayed in the console messages during boot up of a Cat4500X VSS.

```
*Jul 18 12:36:11.138: %C4K_IOSMODPORTMAN-6-MODULEONLINE: Module 11 (WS-C4500X-32
S/N: JAE154503I8 Hw: 1.0) is online
```

Because the Catalyst 4500-X is a "fixed" configuration device, in a VSS, you would expect the two systems to be labeled 'Module 1' and 'Module 2.' However, because of software implementation similarities with the modular Catalyst 4500E series switches, the Standby switch is labeled 'Module 11.'

**Workaround:** None. CSCub11632

- Memory allocation failures can occur if more than 16K IPv6 multicast snooping entries are present.

**Workaround:** None. CSCuc77376

- Beginning with IOS Release XE 3.5.0E, error messages that occur when a QoS policy is applied will no longer appear directly on the console when **no logging console** is configured. They will appear only when a logging method is active (e.g., logging buffered, logging console, ...).

**Workaround:** None. CSCuf86375

- Setting a cos value based on QoS group triggers the following error message in a VSS system

```
set action fail = 9
```

**Workaround:** None. QoS groups are not supported in VSS. CSCuc84739

- Auto negotiation cannot be disabled on the Fa1 port. It must be set to auto/auto, or fixed speed with duplex auto.
- The following messages are seen during boot up after POST check.

```
Rommon reg: 0x00004F80
Reset2Reg: 0x00000F00

Image load status: 0x00000000
#####
Snowtrooper 220 controller 0x0430006E..0x044E161D Size:0x0057B4C5 Program Done!
#####
[ 6642.974087] pci 0000:00:00.0: ignoring class b20 (doesn't match header type 01)
Starting System Services
Calculating module dependencies ...
Loading rtc-ds1307
RTNETLINK answers: Invalid argument
```

```
No Mountpoints DefinedJan 17 09:48:14 %IOSXE-3-PLATFORM: process sshd[5241]: error:
Bind to port
```

```
22 on :: failed: Address already in use
Starting IOS Services
Loading virtuclock as vuclock
Loading gsbu64atomic as gdb64atomic
/dev/fd/12: line 267: /sys/devices/system/edac/mc/edac_mc_log_ce: No such file or
directory
Aug 8 20:30:29 %IOSXE-3-PLATFORM: process kernel: mmc0: Got command interrupt
0x00030000 even though no command operation was in progress.

Aug 8 20:30:29 %IOSXE-3-PLATFORM: process kernel: PME2: fsl_pme2_db_init: not on
ctrl-plane
```

These messages are cosmetic only, and no ssh services are available unless configured within IOS.

**Workaround:** None CSCue15724

## 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.



**Note**

For the latest information on PSIRTS, refer to the Security Advisories on CCO at the following URL:

[http://www.cisco.com/en/US/products/products\\_security\\_advisories\\_listing.html](http://www.cisco.com/en/US/products/products_security_advisories_listing.html)

## Cisco Bug Search Tool

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

To view the details of a caveat listed in this document:

1. Access the BST (use your Cisco user ID and password) at <https://tools.cisco.com/bugsearch/>.
2. Enter the bug ID in the **Search For:** field.
  - [Open Caveats for Cisco IOS XE Release 3.6.xE, page 44](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.8E, page 44](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.7E, page 44](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.6E, page 45](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.5E, page 45](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.4E, page 46](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.3E, page 47](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.2E, page 49](#)
  - [Resolved Caveats for Cisco IOS XE Release 3.6.1E, page 49](#)

- [Resolved Caveats for Cisco IOS XE Release 3.6.0E, page 50](#)

## Open Caveats for Cisco IOS XE Release 3.6.xE

Bug ID	Headline
<a href="#">CSCuz75030</a>	license feature display issue after IOS upgrade
<a href="#">CSCvc47741</a>	Multiple FFM Crashes on 4500 VSS Setup
<a href="#">CSCuv15017</a>	VSS Active Reload causes CTS Ether-channel links on standby to flap.
<a href="#">CSCvc53252</a>	c4500x crashed due to corrupted magic value. Last function JobReviewBody

## Resolved Caveats for Cisco IOS XE Release 3.6.8E

Bug ID	Headline
<a href="#">CSCuw48618</a>	NOVA: Switch crash in FFM with abort called from fib_entry_create_fed_version.
<a href="#">CSCvc40729</a>	Cat 4500x 3.6.2 - crash on Cat4k Mgmt HiPri with Interrupt level Malloc.
<a href="#">CSCve37653</a>	4500 in RPR causing SNMP Input queue full errors and eicore timeouts
<a href="#">CSCve54486</a>	Crash when attempting to assign nonexistent/shutdown VLAN to 802.1x port.
<a href="#">CSCve80873</a>	Service Policy disappears from 10G interface when neighbor port flaps, from 03.06.05.E & onwards,
<a href="#">CSCve37498</a>	Switch sends duplicate accounting message, that causing ISE to generate Misconfigured NAS Alarms.
<a href="#">CSCvf02423</a>	C4500 - 03.06.06.E / 15.2(2)E6 - High CPU due to KxAclPathMan reprogr, KxAclPathMan update.
<a href="#">CSCvf76512</a>	option 82 circuit-id-tag restricted by 6 bytes.
<a href="#">CSCvf83057</a>	Interface flaps once after the port change status from admin down to up
<a href="#">CSCvf96579</a>	2960:AAARadius authentication fails with "switchport voice vlan dot1p" command
<a href="#">CSCvg70852</a>	Unknown MAC addresses appear on port when trying to authenticate using dot1x.
<a href="#">CSCvf18046</a>	sticky timer stops if connected device moved from one port to other within timer expiry.

## Resolved Caveats for Cisco IOS XE Release 3.6.7E

Bug ID	Headline
<a href="#">CSCvc88353</a>	QoS TCAM does not share labels with CTS applied .
<a href="#">CSCty18171</a>	SNMP poll of CISCO-PROCESS-MIB may cause high CPU and SNMP poll timeout.
<a href="#">CSCuu34535</a>	Standby reloads on removing flow monitor.
<a href="#">CSCuv22571</a>	Memory corruption crash in slaJitterPacketBuild.
<a href="#">CSCuw15256</a>	IOS PKI: Certificate validation fails after reload.

Bug ID	Headline
<a href="#">CSCux81234</a>	C4500 VSS port mapped to Drop aggport when the Aggregate port id 656.
<a href="#">CSCuz89309</a>	WS-X4648-RJ45V+E interface becomes unusable after INLINEPOWEROVERDRAWN.
<a href="#">CSCvb76862</a>	4500VSS: Traffic Dropped on VSL due to SPTDROP.
<a href="#">CSCvb97901</a>	4500X 3.8.2 TX-Queue's zero out after multiple reloads.
<a href="#">CSCvc47741</a>	Multiple FFM Crashes on 4500 VSS Setup.
<a href="#">CSCvd01598</a>	Tacacs+ Timeout Retransmission is done 3 times prior marking server down.
<a href="#">CSCvd32541</a>	4500 :: next hop for static route mis-programmed.
<a href="#">CSCvd35291</a>	Removal of "access-session template monitor" creates Drop MAC entries in CAM table.
<a href="#">CSCvd66637</a>	VSS Cat4500 Standby Supervisor memory leak in EICORED process.
<a href="#">CSCve04704</a>	Session blocked in Pending Deletion state due to SM Accounting Feature.

## Resolved Caveats for Cisco IOS XE Release 3.6.6E

Identifier	Description
<a href="#">CSCuz30314</a>	Memory leak in DSensor Cache PROTO and epm authz_sess_info.
<a href="#">CSCum58148</a>	Switch crashes when you modify policer rates of QoS policy.
<a href="#">CSCuz24063</a>	Storm-control configured on port-channel cannot reflect to member link.
<a href="#">CSCuz68659</a>	Unexpected packets seen while learning the mcast traffic.
<a href="#">CSCuz72531</a>	PC MAC deleted from port-security table even with sticky config.
<a href="#">CSCva40478</a>	IP DHCP snooping trust on port-channel does not reflect on member link.
<a href="#">CSCvb04162</a>	Cisco Catalyst 4500 IPv6 QoS Policy w/ L4Ops intermittently not installing on interface.

## Resolved Caveats for Cisco IOS XE Release 3.6.5Ea

Bug ID	Headline
<a href="#">CSCvb19326</a>	NTP leap second addition is not working during leap second event
<a href="#">CSCuv87976</a>	CLI Knob for handling leap second add/delete ignore/ handle
<a href="#">CSCvb29204</a>	BenignCertain on IOS and IOS-XE

## Resolved Caveats for Cisco IOS XE Release 3.6.5E

Identifier	Description
<a href="#">CSCur57853</a>	4500 VSS cannot send snmp trap when active is down
<a href="#">CSCut93424</a>	CAT4500 - Flexible Netflow start/end time inaccuracy

Identifier	Description
<a href="#">CSCuw09327</a>	Crash while config ACL- invalid mem access K5CpuEventCodeInputAclCopy
<a href="#">CSCuy23874</a>	4500: Auto-negotiation issue: port going to 100Mbps instead of 1Gbps
<a href="#">CSCuy19990</a>	IOS 15.2 802.1x critical vlan feature - reinitialize is not working
<a href="#">CSCuz02962</a>	Increasing acl-ack-contexts for auth sessions causing memory exhaustion

## Resolved Caveats for Cisco IOS XE Release 3.6.4E

Bug ID	Headline
CSCuv39850	Switch crashes @auth_mgr_show_method_status_list
CSCuv87875	Crash seen@Galios_newIosHeapMemoryRef on assigning DACL on reauth
CSCuw58095	AMUR MR3: SUP8E crash at dot1x_switch_handle_vlan_removal
CSCuu97550	FB 4500X - SNMP dot1dTpFdbPort retuning incorrect value
CSCus13479	4500X VSS: multicast traffic blackholed on orphan L3 egress portchannel
CSCut57300	With sec ip in SVI, routed packet is not flooded back on incoming port
CSCut71405	IGMP packet not matched by ingress QoS policy if IGMP Snooping enabled
CSCuu43197	C4500X high CPU due to execute show command continuously
CSCuu85298	FIB/LFIB inconsistency after BGP flap
CSCuv07111	IOS and IOS-XE devices changing the next-hop on BGP route with own IP
CSCuv07620	4500X VSS won't notify about license mismatch
CSCuu21448	ISIS Metric with Multiple instances using ciiCircLevelMetric OID
CSCuu42267	vstack status shows duplicate entries for a single PID
CSCuv23475	CPUHOG and crash on "no network 0.0.0.0" with vnet configuration on intf
CSCuu68776	Multicast boundary filter-autorp broken / WS-C4500X / 15.2(1)E 15.2(3)E1
CSCuv00910	bgp afi1/safi1 and afi1/saf4 only peers in the same update-group
CSCuv07796	Truncated output of 'show platform cpu packet buffered'
CSCuv16769	ISIS: Old path not deleted in Global RIB when new path is filtered out
CSCuv19773	"nmosp attach suppress" not being added into run-config on WS-C3850-24P
CSCuv31135	Disable connected-check in one side only makes route as unreachable
CSCuv32845	no message display even unable to allocate memory for vlan mapping
CSCuw06073	EOL CRLF in startup-config breaks 4500x VSS
CSCuv46710	Segmentation Fault in Auth Manager
CSCuv50834	High CPU due to hung NMSP Session
CSCuw21115	4500/WS-X4724-SFP-E port flaps when GLC-GE-100FX is inserted
CSCuw36865	L2 switched traffic matched by L3 SVI VACL in the output direction
CSCuw39020	access-session vlan-assignment ignore-errors breaks dynamic vlan assign
CSCuv76906	"bfd" disappears after issuing "snmp-server host x.x.x.x ABC bfd"
CSCuw09006	Voice Vlan bocked with NEAT Configuration

CSCuw48407	47xx line card failing complete diagnostics after temp sensor failure
CSCuw73525	3650 DHCPv6 Guard does not block rogue DHCP server to provide IPv6 addr
CSCtz92812	"ip vrf Liin-vrf" in running-config on a VSS system
CSCub56668	Handle C4K_HWFLOWMAN-3-NFEINTERRUPTSTATUS: module: fi InterruptStatus:
CSCuj81067	memory leak in crypto_create_pkcs7_msg
CSCum41167	Importing multipath routes changes next-hop to 0.0.0.0 and traffic fails
CSCuw06202	Vstack Download-Config causes 4500 to become unresponsive
CSCuq36627	WAAS Express:Failed to create SSL session. (no available resources)
CSCuo93205	Enable SSL Server Identity Check during SSL handshake
CSCur28336	Memory leak and possible crash when using a logging discriminator
CSCtg15739	Failed sessions are not removed in multi-auth mode
CSCur45606	logging discriminator doesn't work
CSCtb44674	High CPU due to SA-MISS event caused by own mac address packets received
CSCuq46932	Crash on dhcpd_find_binding_by_hw
CSCuu55421	Error - The FRULink 10G Service Module (C3KX-SM-10G) is not responding
CSCuv19258	DACL may not work under IBNS 2.0
CSCuv47729	Packet gets flooded back to the ingress port, when a MEC port is down
CSCuv50669	Port-security blocks X/Y/38 port due to incorrect MAC address
CSCuw52729	Enabling auto qos causes "line vty 0 4" length set to 0
CSCux18867	4500 3.6.0 False port-security alarms on standby supervisor
CSCux38988	redundancy config-sync failures mcl define interface range adds fifth ,

## Resolved Caveats for Cisco IOS XE Release 3.6.3E

Bug ID	Headline
CSCui35423	DHCP bindings are not happening at first try
CSCul73513	Server-client clock not in sync after leap configuration
CSCum17258	EPM_SESS_ERR: Error in activating feature (EPM ACL PLUG-IN)
CSCum56902	Device crashes when classes removed from a policy-map
CSCum65703	Inconsistency on config "privilege" commands as seen in running-config
CSCun14713	Create new accounting session whenever the principal identity changes
CSCun33897	4500 IOS-XE: Crash on ACL/PBR configuration
CSCuo59641	wireshark does not work when file location is usb0:
CSCuo67491	c4500X after enabling MACSEC on the interface IS-IS does not work
CSCuo69316	Console hung for 4+ mnt on issuing 'no int vlan' with ipv6 config
CSCup66629	Traceback @psecure_platform_delete_all_addrs on executing neg events
CSCup81878	Line by Line Sync fails while deleting dynamic NTP peer

CSCup89543	ping with packet size 1469 fails after config span on 4500X VSS
CSCuq31722	The show platform software flood profile command caused SUP8 to crash
CSCuq53140	High cpu seen while sending IPV6 traffic
CSCuq54573	Service Policy disappears from Running Configuration of the interface
CSCuq66263	Switch crashes when ACL add entry
CSCur09175	IPDT is turned on automatically even when dot1x configs are disabled
CSCur58372	snmp-server enable traps syslog shows in "show run all" output after removal
CSCur59242	Crash due to tplus_client_stop_timer
CSCus09761	IOS-Phone not placed in critical voice VLAN when AAA server is not reachable
CSCus13476	CSR handled only one MACSec interface's authentication
CSCus13924	Device crashes while configuring 'Identity' commands
CSCus23125	MAC not learnt after removal of auth config
CSCus32213	CTS manual link does not come up
CSCus46741	Service Policy disappears from running configuration of a 10G iinterface
CSCus47009	Switch does not increment the "Received on untrusted ports" DHCP counter
CSCus79132	Dot1x authentication legacy behaviour broken
CSCut05808	UDP(1975) causes Error msg %IPC-2-INVALIDZONE
CSCut10251	Some commands are not in running-config after AUTOINSTALL finishes
CSCut11679	FFM memory leak is observed when WCCP flaps
CSCut13064	BPDU filter does not work on output port when STP is disabled
CSCut13753	ACLs not syncing to the member switches on stack reload or member reload
CSCut20271	C3560X responds to ARP request from management port
CSCut27272	CPUHOG and crash due to Auth Manager process
CSCut79680	ip default-gateway is not seen in running-config after AUTOINSTALL
CSCut87425	CPU hog in "EEM TCL Proc" after TCL script termination with long runtime
CSCuu22144	Vlan1 IP apply method inconsistencies across Static / DHCP / TFTP
CSCuu25770	IOSd crash triggered by certain CDP packet
CSCuu48400	Amur-E3: HW CoPP counters are not incrementing.
CSCuu50392	Auth Manager memory leak with ISE authentication
CSCuu82134	IBC:VSS-Predator: Active Predator went SMI upgrade but not standby
CSCuu90639	IP address is missing by end of Autoinstall
CSCuu92251	Removing auth mgr configs stops MAC learning on port (no MACs on MATM)
CSCuu97116	Acct messages should include Class attribute from authentication
CSCuv06451	IOSd crash in eap_auth_terminal_state calling free_internal



## Resolved Caveats for Cisco IOS XE Release 3.6.2E

Bug ID	Headline
CSCur25174	Memory usage of the cli_agent process keeps growing
CSCur28069	Traffic does not flow over CTS link during failover
CSCus46086	Dot1x/Mab re-authentication success with "Status: Unauthorized"
CSCus75890	Switch does not resync to NTP server after clock set command or reload
CSCur20444	I/O memory leak due to DHCPv6 packets
CSCur48634	HA fails due to bulk synch failure with encrypted password
CSCus57511	Switch detects high temp, and SNMP trap causes shutdown
CSCug90126	Switch returns incorrect ciscoEnvMonSupplyState SNMP values for 6000/4200 W PSUU.
CSCul29298	Delayed detection of LinkDown message on peer interfaces
CSCuq80812	Incomplete ARP reply received on an active Flex Link port
CSCsv36934	BRIDGE-MIB query does not return information for inactive ports
CSCus32292	4506-E   SUP7L-E   03.06.00.E   Crash - ffm ACL
CSCui99162	When IP device tracking is enabled, ARP probe response floods the VLAN
CSCtf75400	Wrong output for show platform software etherchannel port-channel n map
CSCur58074	Some SFPs are not recognized when inserted into random ports on a switch
CSCuq04533	Cost for secondary VLANs is lost after each reload
CSCur21848	WCCP stops redirecting traffic when eighth port added to service group
CSCur11299	Switch crashes when policy-maps are modified

## Resolved Caveats for Cisco IOS XE Release 3.6.1E

Bug ID	Headline
CSCuc03836	Switch reports SYS-2-MALLOCFAIL error for a very large amount of memory
CSCum47115	EtherType 888e unicast can not pass 2960 with new releases
CSCum80951	TCAM is not sharing when same policy is applied to multiple interfaces
CSCun13984	Catalyst 4500-X reloads while modifying static mac address-table entry
CSCun80959	Desg port on the RootBridge experienced block forward for 30 sec
CSCuo51767	REP preemption is not triggered with link state change
CSCuo80260	Call-home message fails; returns "Unknown" serial number
CSCuo89407	Problem with adding new ports to a channel group.
CSCup48832	Identical IPv6 DHCP remote ID for L2 ports running source-guard/snooping
CSCup96299	IPv6 Multicast RIB entry refer to wrong distanc
CSCuq02796	4500X VSS failure after adding members to port-channel
CSCuq03562	PBR: Not working in XE 3.5.0E under IPBASE license

Bug ID	Headline
CSCuq10827	C3560X cHsrpGrpStandbyState is incorrect
CSCuq32728	3.6.0 - IP phones reboots continuously
CSCuq39071	Mcast packet loss when other receiver leaves group in IGMPv3
CSCup39712	Switch crashes with critical software exception during config push
CSCuq44784	Mingla2: Storm-control on EC suspended post reload
CSCur00722	Hard Reset of the Active Sup cause switch to power cycle

## Resolved Caveats for Cisco IOS XE Release 3.6.0E

Bug ID	Headline
CSCty67871	Baseboard links remain up on improper uplink module removal
CSCub44553	CPU spike seen while sending the multicast traffic to 10k Groups.
CSCub63571	AdjSameIfFail packets in a user defined vnet are dropped
CSCuc49150	User can attach input QoS policy to VSL ports, but cannot dettach it
CSCuf08112	Cat4k Active Sup crash with multi telnet session cli <b>show power module</b>
CSCtk68692	kron-initiated 'write mem' locks nvram indefinitely

## Hardware Documents

Installation guides and notes including specifications and relevant safety information are available at the following URLs:

- *Regulatory Compliance and Safety Information for the Catalyst 4500 Series Switches*  
[http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/hardware/regulatory/compliance/78\\_13233.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/hardware/regulatory/compliance/78_13233.html)
- Installation notes for specific supervisor engines or for accessory hardware are available at:  
[http://www.cisco.com/en/US/products/hw/switches/ps4324/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/products/hw/switches/ps4324/prod_installation_guides_list.html)
- Catalyst 4500-X hardware installation information is available at:  
[http://www.cisco.com/en/US/products/ps12332/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps12332/prod_installation_guides_list.html)

## Software Documentation

Software release notes, configuration guides, command references, and system message guides are available at the following URLs:

- Cisco 4500-X release notes are available at:  
[http://www.cisco.com/en/US/products/ps12332/prod\\_release\\_notes\\_list.html](http://www.cisco.com/en/US/products/ps12332/prod_release_notes_list.html)

Software documents for the Catalyst 4500 Classic, Catalyst 4500 E-Series, Catalyst 4900 Series, and Catalyst 4500-X Series switches are available at the following URLs:

- *Catalyst 4500 Series Software Configuration Guide*

[http://www.cisco.com/en/US/products/hw/switches/ps4324/products\\_installation\\_and\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/hw/switches/ps4324/products_installation_and_configuration_guides_list.html)

- *Catalyst 4500 Series Software Command Reference*

[http://www.cisco.com/en/US/products/hw/switches/ps4324/prod\\_command\\_reference\\_list.html](http://www.cisco.com/en/US/products/hw/switches/ps4324/prod_command_reference_list.html)

- *Catalyst 4500 Series Software System Message Guide*

[http://www.cisco.com/en/US/products/hw/switches/ps4324/products\\_system\\_message\\_guides\\_list.html](http://www.cisco.com/en/US/products/hw/switches/ps4324/products_system_message_guides_list.html)

## Cisco IOS Documentation

Platform-independent Cisco IOS documentation may also apply to the Catalyst 4500 and 4900 switches. These documents are available at the following URLs:

- Cisco IOS configuration guides, Release 12.x

[http://www.cisco.com/en/US/products/ps6350/products\\_installation\\_and\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps6350/products_installation_and_configuration_guides_list.html)

- Cisco IOS command references, Release 12.x

[http://www.cisco.com/en/US/products/ps6350/prod\\_command\\_reference\\_list.html](http://www.cisco.com/en/US/products/ps6350/prod_command_reference_list.html)

You can also use the Command Lookup Tool at:

<http://tools.cisco.com/Support/CLILookup/cltSearchAction.do>

- Cisco IOS system messages, version 12.x

[http://www.cisco.com/en/US/products/ps6350/products\\_system\\_message\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps6350/products_system_message_guides_list.html)

You can also use the Error Message Decoder tool at:

<http://www.cisco.com/pcgi-bin/Support/Errordecoder/index.cgi>

## Commands in Task Tables

Commands listed in task tables show only the relevant information for completing the task and not all available options for the command. For a complete description of a command, refer to the command in the *Catalyst 4500 Series Switch Cisco IOS Command Reference*.

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