

# Release Notes for the Cisco Catalyst 4500E Series Switch, Cisco IOS XE 3.11.xE

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## Release Notes for the Catalyst 4500E Series Switch, Cisco IOS XE 3.11.xE

### Introduction

This release note describes the features, modifications, and caveats for the Cisco IOS XE Release 3.11.xE, on the Cisco Catalyst 4500E Series Switches with Supervisor Engine 9-E, 8L-E, 8-E, 7L-E, and 7-E.



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**Note** End-of-Life has been announced for [Cisco Catalyst 4500 Supervisor Engine 7-E](#) and [Cisco Catalyst 4500 Supervisor Engine 7L-E](#).

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Cisco IOS XE Release 3.11.xE is a feature rich new software feature release for Cisco IOS-XE based Catalyst Access Switching products.



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**Note** Although Cisco Catalyst 4500E Series Switches and Cisco Catalyst 4500-X Series Switches have separate release notes, each leverages the same Software Configuration Guide and Command Reference Guide.

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### Cisco IOS Software Packaging

Cisco Catalyst 4500E Series Switches support these license levels or feature sets.

The following permanent right-to-use licenses or base licenses are available:

- Enterprise Services—image supports all Cisco Catalyst 4500E Series software features based on Cisco IOS Software, including enhanced routing.
- IP Base
- LAN Base

Starting with Cisco IOS XE Release 3.10.0E, the following add-on license options are available:

- DNA Essentials
- DNA Advantage

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

## Cisco IOS XE Release Strategy

Cisco IOS XE Release 3.11.xE, 3.8.xE, 3.6.xE, 3.4.xSG, and 3.2.xSG are extended maintenance (EM) releases.

Cisco IOS XE Release 3.10.xE, 3.9.xE, 3.7.xE, 3.5.xE, and 3.3.0SG are standard maintenance releases (SM).

Cisco IOS XE Release 3.10.0E and later releases support Sup9-E.

Cisco IOS XE Release 3.8.1E and later releases support Sup8L-E.

Cisco IOS XE Release 3.8.xE is a maintenance train supporting Sup7E, Sup7L-E and Sup8-E.

Cisco IOS XE Release 3.6.xSG is a maintenance train supporting Sup7E, Sup7L-E and Sup8-E.

Cisco IOS XE Release 3.4.xSG is a maintenance train supporting Sup7E and Sup7L-E.

### Support

Support for Cisco IOS XE Release 3.11.xE 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-E Series Switch

*Table 1: Supported Hardware on Cisco Catalyst 4500-E*

| Product Number (append with "=" for spares) | Product Description  |
|---|--|
| WS-X45-Sup7-E                               | Cisco Catalyst 4500 E-Series Supervisor Engine 7-E<br><b>Note</b> This engine is supported on E-series, R-E, and R+E chassis.    |
| WS-X45-Sup7L-E                              | Cisco Catalyst 4500 E-Series Supervisor Engine 7L-E<br><b>Note</b> This engine is supported on E-series, R-E, and R+E chassis.   |
| WS-X45-Sup8-E                               | Cisco Catalyst 4500 E-Series Supervisor Engine 8-E<br>This engine is supported on E-series and R+E and R-E <sup>1</sup> chassis. |

| <b>Product Number (append with "=" for spares)</b> | <b>Product Description</b>   |
|--|--|
| WS-X45-Sup8L-E                                     | Cisco Catalyst 4500 E-Series Supervisor Engine 8L-E<br>This engine is supported on E-series and R+E and R-E 1 chassis.   |
| WS-X45-SUP9-E                                      | Cisco Catalyst 4500 E-Series Supervisor Engine 9-E.<br>This engine is supported on E-series and R+E chassis.   |
| <b>10 Gigabit Ethernet Switching Modules</b>       |  |
| WS-X4748-12X48U+E                                  | Catalyst 4500E 48-Port UPOE with 12 Multigigabit ports and 36 10/100/1000 ports. This module supports the Cisco Multigigabit technology for 802.11ac Wave2 and 10GBASE-T speeds. |
| WS-X4712-SFP+E                                     | 12-port 10 Gigabit Ethernet (SFP+) line card<br>Not supported on 4507R-E and 4510R-E chassis.  |
| WS-X4606-X2-E                                      | 6-port X2 line card  |
| <b>Gigabit Ethernet Switching Modules</b>          |  |
| WS-X4302-GB  | 2-port 1000BASE-X (GBIC) Gigabit Ethernet module.<br>Not supported in VSS mode.  |
| WS-X4306-GB  | 6-port 1000BASE-X (GBIC) Gigabit Ethernet switching module   |
| WS-X4412-2GB-T                                     | 12-port 1000BASE-T Gigabit Ethernet and 2-GBIC ports switching module.<br>Not supported in VSS mode.   |
| WS-X4424-GB-RJ45                                   | 24-port 10/100/1000BASE-T Gigabit Ethernet RJ-45 switching module<br>Not supported in VSS mode.  |
| WS-X4418-GB  | 18-port 1000BASE-X (GBIC) Gigabit Ethernet switching module.<br>Not supported in VSS mode.   |
| WS-X4448-GB-LX                                     | 48-port 1000BASE-LX (small form-factor pluggable) Gigabit Ethernet fiber optic interface switching module.<br>Not supported in VSS mode  |
| WS-X4448-GB-RJ45                                   | 48-port 10/100/1000BASE-T Gigabit Ethernet switching module.<br>Not supported in VSS mode.   |

| Product Number (append with "=" for spares) | Product Description   |
|---|---|
| WS-X4448-GB-SFP                             | 48-port 1000BASE-X (small form-factor pluggable) module.<br>Not supported in VSS mode.  |
| WS-X4506-GB-T                               | 6-port Alternately-Wired 10/100/1000BASE-T Catalyst 4500 series Power over Ethernet (PoE) 802.3af or 1000BASE-X SFP.<br>Not supported in VSS mode   |
| WS-X4524-GB-RJ45V                           | 24-port 10/100/1000BASE-T RJ-45 Catalyst 4500 series PoE 802.3af.<br>Not supported in VSS mode.   |
| WS-X4548-GB-RJ45                            | 48-port 10/100/1000BASE-T Gigabit Ethernet module.<br>Not supported in VSS mode.  |
| WS-X4548-GB-RJ45V                           | 48-port 10/100/1000BASE-T, Gigabit Ethernet module with PoE IEEE 802.3af.<br>This module is supported on Supervisor Engines 7E and 7LE, but not on Supervisor Engines 8E and 8LE. This module is not supported in VSS mode. |
| WS-X4548-RJ45V+                             | 48-port 10/100/1000BASE-T, Gigabit Ethernet module with IEEE 802.3af PoEP and IEEE 802.3at PoEP.<br>This module is supported on Supervisor Engines 7-E and 7L-E, but not on Supervisor Engines 8-E and 8L-E.                |
| WS-X4612-SFP-E                              | 12-port 1000BASE-X (small form factor pluggable) module with jumbo frame support  |
| WS-X4624-SFP-E                              | Non-blocking 24-port 1000BASEX (small form factor pluggable) module   |
| WS-X4640-CSFP-E                             | 80 ports with Gigabit compact SFP (4:1 oversubscribed); 40 modules of Gigabit SFP line card (1000BaseX), providing 24 gigabits per-slot capacity (SFP optional) (2:1 oversubscribed)  |
| WS-X4648-RJ45-E                             | 48 port 10/100/1000BT with 2 to 1 oversubscription and jumbo frame support  |
| WS-X4648-RJ45V-E                            | 48 port 10/100/1000 Mb with 2 to 1 oversubscription PoE 802.3af providing up to 20 Watts power/port   |
| WS-X4648-RJ45V+E                            | 48 port 10/100/1000 Mb with 2 to 1 oversubscription PoE 802.3at providing up to 30 Watts power/port   |

| <b>Product Number (append with "=" for spares)</b>       | <b>Product Description</b>  |
|--|---|
| WS-X4748-RJ45V+E   | 48-port 10/100/1000 line card nonblocking PoE 802.3at providing up to 30 Watts power/port                                   |
| WS-X4748-UPOE+E  | 48-port 10/100/1000 line card nonblocking PoE 802.3at and 60 watt UPoE PoE linecard with Ethernet Energy Efficient feature. |
| WS-X4748-RJ45-E  | 48-port 10/100/1000 nonblocking line card with the Ethernet Energy Efficient feature  |
| WS-X4748-SFP-E   | 48-port 1000Base-X SFP (small form factor pluggable) line card  |
| WS-X4724-SFP-E   | 24-port 1000Base-X SFP (small form factor pluggable) line card  |
| WS-X4712-SFP-E   | 12-port 1000Base-X SFP (small form factor pluggable) line card  |
| <b>Fast Ethernet Switching Modules</b>                   |   |
| WS-X4124-FX-MT   | 24-port 100BASE-FX Fast Ethernet MT-RJ multimode fiber switching module.<br>Not supported in VSS mode.                      |
| WS-X4148-FX-MT   | 48-port 100BASE-FX Fast Ethernet MT-RJ multimode fiber switching module   |
| WS-X4148-FE-LX-MT  | 48-port 100BASE-LX10 Fast Ethernet MT-RJ single-mode fiber switching module.<br>Not supported in VSS mode.                  |
| WS-X4148-FE-BD-LC  | 48-port 100BASE-BX10-D module   |
| WS-X4248-FE-SFP  | 48-port 100BASE-X SFP switching module  |
| WS-U4504-FX-MT   | 4-port 100BASE-FX (MT-RF) uplink daughter card  |
| WS-X4504-FX-MT   | 4-port 100BASE-FX MT-RJ uplink module.<br>Not supported in VSS mode.  |
| <b>Ethernet/Fast Ethernet (10/100) Switching Modules</b> |   |
| WS-X4124-RJ45  | 24-port 10/100 RJ-45 module.<br>Not supported in VSS mode.  |
| WS-X4148-RJ  | 48-port 10/100 RJ-45 switching module   |

| Product Number (append with "=" for spares)   | Product Description   |
|---|---|
| WS-X4148-RJ21   | 48-port 10/100 4xRJ-21 (telco connector) switching module.<br>Not supported in VSS mode.  |
| WS-X4148-RJ45V  | 48-port Pre-standard PoE 10/100BASE-T switching module.<br>Not supported in VSS mode.   |
| WS-X4224-RJ45V  | 24-port 10/100BASE-TX RJ-45 Cisco Catalyst 4500 series PoE 802.3af.<br>Not supported in VSS mode.   |
| WS-X4232-GB-RJ  | 32-port 10/100 Fast Ethernet RJ-45, plus 2-port 1000BASE-X (GBIC) Gigabit Ethernet switching module.<br>Not supported in VSS mode.  |
| WS-X4248-RJ21V  | 48-port 10/100 Fast Ethernet RJ-21 Cisco Catalyst 4500 series PoE 802.3af telco<br>Not supported in VSS mode.   |
| WS-X4248-RJ45V  | 48-port 10/100 Fast Ethernet RJ-45 Cisco Catalyst 4500 series PoE 802.3af.<br>This module is supported only on Supervisor Engines 7-E and 7L-E, but not supported on Supervisor Engines 8-E and 8L-E. |
| WS-X4232-RJ-XX  | 32-port 10/100 Fast Ethernet RJ-45 modular uplink switching module.<br>Not supported in VSS mode.   |
| WS-X4232-L3   | 32-port 10/100 Fast Ethernet, plus 2-port 1000BASE-X (GBIC) Gigabit Ethernet services module.<br>Not supported in VSS mode.   |
| <b>Other Modules</b>  |   |
| MEM-X45-2GB-E   | SD Card, 2G   |
| USB-X45-4GB-E   | USB Thumb Drive, 4G   |
| <sup>1</sup> To support Supervisor Engine 8-E or 8L-E, the Cisco Catalyst 4507R-E Switch chassis must have hardware revision 2.0 or higher. For information about identifying the revision numbers see the <i>Identifying Hardware Revisions on the Switch Chassis</i> section. |   |

**Table 2: Supported Pluggable Transceiver Modules**

| Module Type  | URL   |
|--|---|
| Cisco 10-Gigabit Ethernet Transceiver Modules Compatibility Matrix       | <a href="http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/10GE_Tx_Matrix.html">http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/10GE_Tx_Matrix.html</a>   |
| Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix          | <a href="http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/GE_Tx_Matrix.html">http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/GE_Tx_Matrix.html</a>       |
| Cisco 100-Megabit Ethernet SFP Modules Compatibility Matrix              | <a href="http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/100MB_Tx_Matrix.html">http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/100MB_Tx_Matrix.html</a> |
| Cisco 40-Gigabit Ethernet Transceiver Modules Compatibility Matrix       | <a href="http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/40GE_Tx_Matrix.html">http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/40GE_Tx_Matrix.html</a>   |
| Cisco Wavelength Division Multiplexing Transceivers Compatibility Matrix | <a href="http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6982.html">http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6982.html</a>                 |

**Table 3: Power over Ethernet on Cisco Catalyst 4500-E**

| Type   | URL   |
|--|---|
| Power over Ethernet on the Cisco Catalyst 4500E Series Platform Data Sheet | <a href="http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-4500-series-switches/product_data_sheet09186a00801f3dd9.html">http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-4500-series-switches/product_data_sheet09186a00801f3dd9.html</a> |

## Supported E-Series Hardware on Cisco IOS XE Release 3.11.xE

A brief list of primary E-Series hardware supported by Cisco IOS XE Release 3.11.xE is shown in the following table:

**Table 4: Supported E-Series Hardware**

| Product Number | Description   |
|----------------|---|
| WS-C4503-E     | Cisco Catalyst 4500-E Series 3-Slot Chassis <ul style="list-style-type: none"> <li>• Fan tray</li> <li>• No Power Supply</li> </ul> |
| WS-C4506-E     | Cisco Catalyst 4500-E Series 6-Slot Chassis <ul style="list-style-type: none"> <li>• Fan tray</li> <li>• No Power Supply</li> </ul> |

| Product Number | Description  |
|----------------|--|
| WS-C4507R-E    | <p data-bbox="922 289 1398 321">Cisco Catalyst 4500-E Series 7-Slot Chassis.</p> <p data-bbox="922 338 1481 510"><b>Note</b> The chassis does not support Supervisor Engine 9-E.<br/>The chassis requires hardware revision 2.0 or higher to support Supervisor Engines 8-E and 8L-E.</p> <ul data-bbox="956 548 1481 793" style="list-style-type: none"> <li>• Fan tray</li> <li>• No Power Supply</li> <li>• Redundant supervisor engine capability</li> <li>• In this chassis, supervisor engines must sit in slots 3 and/or 4; the backplane will enforce this restriction.</li> </ul> |
| WS-C4507R+E    | <p data-bbox="922 837 1451 898">Cisco Catalyst 4500-E Series 7-Slot 48 GB-ready Chassis.</p> <ul data-bbox="956 915 1481 1161" style="list-style-type: none"> <li>• Fan tray</li> <li>• No Power Supply</li> <li>• Redundant supervisor engine capability</li> <li>• In this chassis, supervisor engines must sit in slots 3 and/or 4; the backplane will enforce this restriction.</li> </ul>   |
| WS-C4510R-E    | <p data-bbox="922 1207 1406 1239">Cisco Catalyst 4500-E Series 10-Slot Chassis</p> <p data-bbox="922 1255 1481 1316"><b>Note</b> This chassis does not support Supervisor Engines 9-E, 8L-E, and 7L-E.</p> <ul data-bbox="956 1354 1481 1600" style="list-style-type: none"> <li>• Fan tray</li> <li>• No Power Supply</li> <li>• Redundant supervisor engine capability</li> <li>• In this chassis, supervisor engines must sit in slots 5 and/or 6; the backplane will enforce this restriction.</li> </ul>  |



| Product Number | Description  |
|----------------|--|
| WS-C4510R+E    | <p>Cisco Catalyst 4500-E Series 10-Slot 48 GB-ready Chassis</p> <p><b>Note</b> This chassis does not support Supervisor Engines 7L-E and 8L-E.</p> <ul style="list-style-type: none"> <li>• Fan tray</li> <li>• No Power Supply</li> <li>• Redundant supervisor engine capability</li> <li>• In this chassis, supervisor engines must sit in slots 5 and/or 6; the backplane will enforce this restriction.</li> </ul> |

## Wired Web UI (Device Manager) System Requirements

### Software Requirements

- Windows 2000, Windows 2003, Windows XP, Windows Vista, or Windows 7
- With JavaScript enabled: Internet Explorer 6.0 and 7.0, or Firefox 26.0

## Feature Support by Image Type

The following table is a detailed list of features supported on Cisco Catalyst 4500 E-Series Supervisor Engines 9-E, 8L-E, 8-E, 7L-E, and 7-E running Cisco IOS XE Release 3.11.xE categorized by image type.

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

**Table 5: LAN Base, IP Base, and Enterprise Services Image supported on Cisco Catalyst 4500 E-Series Supervisor Engines 9-E, 8L-E, 8-E, 7L-E, and 7-E**

| Feature                        | LAN Base | IP Base | Enterprise Services |
|--------------------------------|----------|---------|---------------------|
| 2-way Community Private VLANs  | Yes      | Yes     | Yes                 |
| 8-Way CEF Load Balancing       | Yes      | Yes     | Yes                 |
| 10 Gigabit Uplink Use          | Yes      | Yes     | Yes                 |
| AAA Server Group               | Yes      | Yes     | Yes                 |
| AAA Server Group Based on DNIS | Yes      | Yes     | Yes                 |
| ACL—Improved Merging Algorithm | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| ACL Logging   | Yes      | Yes     | Yes                 |
| ACL Policy Enhancements   | Yes      | Yes     | Yes                 |
| ACL Sequence Numbering  | Yes      | Yes     | Yes                 |
| Address Resolution Protocol (ARP)   | Yes      | Yes     | Yes                 |
| ANCP Client   | No       | Yes     | Yes                 |
| ANSI TIA-1057 LLDP—MED Location Extension   | Yes      | Yes     | Yes                 |
| ANSI TIA-1057 LLDP—MED Support  | Yes      | Yes     | Yes                 |
| Application Visibility and Control with Domain Name System-Authoritative Source (AVC with DNS-AS) | No       | Yes     | Yes                 |
| FNF for AVC with DNS-AS   | No       | Yes     | Yes                 |
| ARP Optimization  | Yes      | Yes     | Yes                 |
| Auto Configuration  | Yes      | Yes     | Yes                 |
| Auto Identity   | No       | Yes     | Yes                 |
| Auto-LAG  | Yes      | Yes     | Yes                 |
| Auto QoS  | Yes      | Yes     | Yes                 |
| Auto QoS Compact  | Yes      | Yes     | Yes                 |
| Auto Security   | Yes      | Yes     | Yes                 |
| Auto SmartPorts   | Yes      | Yes     | Yes                 |
| Auto-MDIX   | Yes      | Yes     | Yes                 |
| Auto-Voice VLAN (part of Auto QoS)  | Yes      | Yes     | Yes                 |
| AutoInstall Using DHCP for LAN Interfaces   | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| AutoQoS—VoIP  | Yes      | Yes     | Yes                 |
| AutoRP Enhancement  | No       | Yes     | Yes                 |
| Banner Page and Inactivity timeout for HTTP/S connections     | Yes      | Yes     | Yes                 |
| BGP   | No       | No      | Yes                 |
| BGP 4   | No       | No      | Yes                 |
| BGP 4 4Byte ASN (CnH)   | No       | No      | Yes                 |
| BGP 4 Multipath Support                                       | No       | No      | Yes                 |
| BGP 4 Prefix Filter and In-bound Route Maps                   | No       | No      | Yes                 |
| BGP 4 Soft Config   | No       | No      | Yes                 |
| BGP Conditional Route Injection                               | No       | No      | Yes                 |
| BGP Configuration Using Peer Templates                        | No       | No      | Yes                 |
| BGP Dynamic Update Peer-Groups                                | No       | No      | Yes                 |
| BGP Increased Support of Numbered as-path Access Lists to 500 | No       | No      | Yes                 |
| BGP Link Bandwidth  | No       | No      | Yes                 |
| BGP Neighbor Policy   | No       | No      | Yes                 |
| BGP Prefix-Based Outbound Route Filtering                     | No       | No      | Yes                 |
| BGP Restart Neighbor Session After max-prefix Limit Reached   | No       | No      | Yes                 |
| BGP Route-Map Continue  | No       | No      | Yes                 |
| BGP Route-Map Continue Support for Outbound Policy            | No       | No      | Yes                 |
| BGP Soft Rest   | No       | No      | Yes                 |

| Feature   | LAN Base | IP Base            | Enterprise Services |
|---|----------|--------------------|---------------------|
| BGP Wildcard  | No       | No                 | Yes                 |
| Bidirectional PIM (IPv4 only)   | Yes      | Yes                | Yes                 |
| Bidirectional SXP support   | Yes      | Yes                | Yes                 |
| Bidirectional Forwarding Detection (BFD) for Intermediate System to Intermediate System (IS-IS)             | No       | No                 | Yes                 |
| Boot Config   | Yes      | Yes                | Yes                 |
| Broadcast/Multicast Suppression   | Yes      | Yes                | Yes                 |
| Call Home   | No       | Yes                | Yes                 |
| Campus Fabric   | No       | Yes (Sup 8-E, 9-E) | Yes (Sup 8-E, 9-E)  |
| CDP (Cisco Discovery Protocol) Version 2  | Yes      | Yes                | Yes                 |
| CDP Enhancement —Host presence TLV  | Yes      | Yes                | Yes                 |
| CEF/dCEF—Cisco Express Forwarding   | Yes      | Yes                | Yes                 |
| CEFv6 Switching for 6to4 Tunnels  | No       | Yes                | Yes                 |
| CEFv6/dCEFv6 — Cisco Express Forwarding   | Yes      | Yes                | Yes                 |
| CFM/IEEE 802.1ag - D8.1 standard Compliant CFM, Y.1731 multicast LBM / AIS / RDI / LCK, IP SLA for Ethernet | Yes      | Yes                | Yes                 |
| CGMP — Cisco Group Management Protocol  | No       | Yes                | Yes                 |
| Cisco IOS Scripting w/Tcl   | Yes      | Yes                | Yes                 |
| Cisco Plug-in for OpenFlow  | Yes      | Yes                | Yes                 |

| Feature  | LAN Base | IP Base | Enterprise Services |
|--|----------|---------|---------------------|
| Cisco-Port-QoS-MIB—Support for cportQosQueueEnqueuePkts and cportQosQueueDropPkts  | Yes      | Yes     | Yes                 |
| Cisco Service Discovery Gateway Support  | Yes      | Yes     | Yes                 |
| Cisco TrustSec—IEEE 802.1ae MACSec Layer 2 encryption  | No       | Yes     | Yes                 |
| Cisco TrustSec—IEEE 802.1ae MACSec encryption on user facing ports   | No       | Yes     | Yes                 |
| Cisco TrustSec—IEEE 802.1ae MACSec encryption on user facing ports SSO   | No       | Yes     | Yes                 |
| Cisco TrustSec—IEEE 802.1ae MACSec encryption between switch-to-switch links using Cisco SAP (Security Association Protocol) | No       | Yes     | Yes                 |
| Cisco TrustSec—Critical Authentication   | Yes      | Yes     | Yes                 |
| Cisco TrustSec—SGT Exchange Protocol (SXP) IPv4  | No       | Yes     | Yes                 |
| Cisco TrustSec—SGT/SGA   | No       | Yes     | Yes                 |
| Cisco TrustSec—SGACL Logging and Statistics  | No       | Yes     | Yes                 |
| CiscoView Autonomous Device Manager (ADP)  | No       | Yes     | Yes                 |
| Class Based Ethernet CoS Matching & Marking (802.1p & ISL CoS)   | Yes      | Yes     | Yes                 |
| Class-Based Marking  | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| Class-Based Policing  | Yes      | Yes     | Yes                 |
| Class-Based Shaping   | Yes      | Yes     | Yes                 |
| Clear Counters Per Port   | Yes      | Yes     | Yes                 |
| CLI String Search   | Yes      | Yes     | Yes                 |
| CNS—Configuration Agent, Event Agent, Image Agent, Interactive CLI, Config Retrieve Enhancement with Retry and Interval | Yes      | Yes     | Yes                 |
| Command Scheduler (Kron)  | Yes      | Yes     | Yes                 |
| Command Scheduler (Kron) Policy for System Startup  | Yes      | Yes     | Yes                 |
| Commented IP Access List Entries  | Yes      | Yes     | Yes                 |
| Community Private VLAN  | Yes      | Yes     | Yes                 |
| Configuration Change Tracking Identifier  | Yes      | Yes     | Yes                 |
| Configuration Change Notification and Logging   | No       | Yes     | Yes                 |
| Configuration Replace and Configuration Rollback; Configuration Rollback Confirmed Change                               | Yes      | Yes     | Yes                 |
| Configuring FQDN ACL  | Yes      | Yes     | Yes                 |
| Contextual Configuration Diff Utility   | Yes      | Yes     | Yes                 |
| Control Plane Policing (Copp)   | Yes      | Yes     | Yes                 |
| Control Plane Protection (Wireless)   | No       | Yes     | Yes                 |

| Feature  | LAN Base | IP Base | Enterprise Services |
|--|----------|---------|---------------------|
| CPU Optimization for Layer 3 Multicast Control Packets | Yes      | Yes     | Yes                 |
| Critical Authorization for Voice and Data              | Yes      | Yes     | Yes                 |
| DAI (Dynamic ARP inspection)                           | Yes      | Yes     | Yes                 |
| DBL (Dynamic Buffer Limiting) - Selective DBL          | Yes      | Yes     | Yes                 |
| Debounce Timer per Port                                | Yes      | Yes     | Yes                 |
| Default Passive Interface                              | No       | Yes     | Yes                 |
| Diffserv MIB   | Yes      | Yes     | Yes                 |
| DHCP Client  | Yes      | Yes     | Yes                 |
| DHCP Configurable DHCP Client                          | Yes      | Yes     | Yes                 |
| DHCP Gleaning  | No       | Yes     | Yes                 |
| DHCP Option 82, Pass Through                           | Yes      | Yes     | Yes                 |
| DHCPv6 Ethernet Remote ID option                       | Yes      | Yes     | Yes                 |
| DHCPv6 Option 18                                       | Yes      | Yes     | Yes                 |
| DHCPv6 Option 37 (Relay Options Remote-ID)             | Yes      | Yes     | Yes                 |
| DHCPv6 Option 52 (CAPWAP Access Controller)            | No       | Yes     | Yes                 |
| DHCPv6 Relay Agent notification for Prefix Delegation  | Yes      | Yes     | Yes                 |
| DHCPv6 Relay - Reload persistent Interface ID option   | Yes      | Yes     | Yes                 |
| DHCPv6 Repackaging                                     | Yes      | Yes     | Yes                 |
| DHCP Server  | Yes      | Yes     | Yes                 |

| Feature  | LAN Base | IP Base                        | Enterprise Services                    |
|--|----------|--------------------------------|--|
| DHCP Snooping                                    | Yes      | Yes                            | Yes                                    |
| DSCP/CoS via LLDP                                | Yes      | Yes                            | Yes                                    |
| Duplication Location Reporting Issue             | Yes      | Yes                            | Yes                                    |
| Dynamic Trunking Protocol (DTP)                  | Yes      | Yes                            | Yes                                    |
| Easy Virtual Network (EVN)                       | No       | No                             | Yes                                    |
| Easy VSS <sup>2</sup>                            | No       | Yes (SUP 9-E, 8-E and 7E only) | Yes (SUP 9-E, 8L-E, 8-E, 7L-E, and 7E) |
| EIGRP  | No       | No                             | Yes                                    |
| EIGRP Service Advertisement Framework            | Yes      | Yes                            | Yes                                    |
| EIGRP Stub Routing                               | No       | Yes                            | Yes                                    |
| Embedded Event Manager (EEM) 3.2                 | No       | Yes                            | Yes                                    |
| Embedded Syslog Manager (ESM)                    | Yes      | Yes                            | Yes                                    |
| Enable Bidirectional SXP support                 | Yes      | Yes                            | Yes                                    |
| Enable of Security Group ACL at Interface Level  | Yes      | Yes                            | Yes                                    |
| Energywise Agentless SNMP support                | Yes      | Yes                            | Yes                                    |
| Energywise Wake-On-Lan Support                   | Yes      | Yes                            | Yes                                    |
| Enhanced PoE Support (Additional Wattage Range)  | Yes      | Yes                            | Yes                                    |
| Entity API for Physical and Logical Mgd Entities | Yes      | Yes                            | Yes                                    |
| ErrDisable timeout                               | Yes      | Yes                            | Yes                                    |
| EtherChannel                                     | Yes      | Yes                            | Yes                                    |



| <b>Feature</b>                                     | <b>LAN Base</b> | <b>IP Base</b> | <b>Enterprise Services</b> |
|--|-----------------|----------------|----------------------------|
| EtherChannel Flexible PAgP                         | Yes             | Yes            | Yes                        |
| EtherChannel Single Port Channel                   | Yes             | Yes            | Yes                        |
| Ethernet Virtual Connections (EVC)-Lite            | No              | Yes            | Yes                        |
| Fast EtherChannel (FEC)                            | Yes             | Yes            | Yes                        |
| FHRP—Enhanced Object Tracking of IP SLAs           | Yes             | Yes            | Yes                        |
| FHRP—Enhanced Object Tracking integration with EEM | Yes             | Yes            | Yes                        |
| FHRP—GLBP - IP Redundancy API                      | No              | Yes            | Yes                        |
| FHRP—HSRP - Hot Standby Router Protocol V2         | No              | Yes            | Yes                        |
| FHRP—Object Tracking List                          | No              | Yes            | Yes                        |
| Filter-ID Based ACL Application                    | Yes             | Yes            | Yes                        |
| FIPS 140-2/3 Level 2 Certification                 | Yes             | Yes            | Yes                        |
| FIPS/CC Compliance for NMSP                        | Yes             | Yes            | Yes                        |
| Flexible NetFlow—Application ID                    | No              | Yes            | Yes                        |

| Feature  | LAN Base | IP Base | Enterprise Services |
|--|----------|---------|---------------------|
| Flexible NetFlow —CTS Fields, Device Type, Ethertype, Full Flow Support, Ingress support, IPv4 and IPv6 Unicast Flows, Layer 2 Fields, Multiple User Defined Caches, Netflow Export over IPv4, NetFlowV5 Export protocol, NetFlow V9 Export Format, Power Reading, Username, VLAN ID support, Export to an IPv6 address, IPFIX | No       | Yes     | Yes                 |
| Flex Links+(VLAN Load balancing)   | Yes      | Yes     | Yes                 |
| Forced 10/100 Autonegotiation  | Yes      | Yes     | Yes                 |
| FQDN   | Yes      | Yes     | Yes                 |
| FTP Support for Downloading Software Images  | Yes      | Yes     | Yes                 |
| Gateway Load Balancing Protocol (GLBP)   | No       | Yes     | Yes                 |
| Generic Routing Encapsulation (GRE)  | No       | Yes     | Yes                 |
| GOLD Online Diagnostics  | Yes      | Yes     | Yes                 |
| GRE Tunneled Packets Switched on Hardware  | No       | No      | Yes                 |
| HSRP: Global IPv6 Address  | No       | Yes     | Yes                 |
| HSRP - Hot Standby Router Protocol   | No       | Yes     | Yes                 |
| HSRPv2 for IPv6 Global Address Support   | No       | Yes     | Yes                 |
| HTTP Gleaning  | No       | Yes     | Yes                 |
| HTTP Security  | Yes      | Yes     | Yes                 |

| <b>Feature</b>  | <b>LAN Base</b> | <b>IP Base</b> | <b>Enterprise Services</b> |
|---|-----------------|----------------|----------------------------|
| HTTP TACAC+ Accounting support  | Yes             | Yes            | Yes                        |
| IEEE 802.1ab LLDP (Link Layer Discovery Protocol)<br>IEEE 802.1ab LLDP enhancements (PoE+Layer 2 COS) | Yes             | Yes            | Yes                        |
| IEEE 802.1p Support   | Yes             | Yes            | Yes                        |
| IEEE 802.1Q VLAN Trunking   | Yes             | Yes            | Yes                        |
| IEEE 802.1s Multiple Spanning Tree (MST) Standard Compliance  | Yes             | Yes            | Yes                        |
| IEEE 802.1s VLAN Multiple Spanning Trees  | Yes             | Yes            | Yes                        |
| IEEE 802.1t <sup>3</sup>  | Yes             | Yes            | Yes                        |
| IEEE 802.1w Spanning Tree Rapid Reconfiguration   | Yes             | Yes            | Yes                        |

| Feature                                     | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| IEEE 802.1x Auth Fail Open (Critical Ports) | Yes      | Yes     | Yes                 |
| IEEE 802.1x Auth Fail VLAN                  |          |         |                     |
| IEEE 802.1x Flexible Authentication         |          |         |                     |
| IEEE 802.1x Multiple Authentication         |          |         |                     |
| IEEE 802.1x Open Authentication             |          |         |                     |
| IEEE 802.1X with User Distribution          |          |         |                     |
| IEEE 802.1x VLAN Assignment                 |          |         |                     |
| IEEE 802.1x VLAN User Group Distribution    |          |         |                     |
| IEEE 802.1x Wake on LAN Support             |          |         |                     |
| IEEE 802.1x Authenticator                   |          |         |                     |
| IEEE 802.1x Fallback support                |          |         |                     |
| IEEE 802.1x Guest VLAN                      |          |         |                     |
| IEEE 802.1x Multi-Domain Authentication     |          |         |                     |
| IEEE 802.1x Private Guest VLAN              |          |         |                     |
| IEEE 802.1x Private VLAN Assignment         |          |         |                     |
| IEEE 802.1x RADIUS Accounting               | Yes      | Yes     | Yes                 |
| IEEE 802.1x RADIUS-Supplied Session Timeout |          |         |                     |
| IEEE 802.1x with ACL Assignments            | Yes      | Yes     | Yes                 |
| IEEE 802.1x with Port Security              |          |         |                     |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| IEEE 802.3ad Link Aggregation (LACP)  | Yes      | Yes     | Yes                 |
| IEEE 802.3ad Link Aggregation (LACP) Port-Channel Standalone Disable  |          |         |                     |
| IEEE 802.3af PoE (Power over Ethernet)  | Yes      | Yes     | Yes                 |
| IEEE 802.3x Flow Control  | Yes      | Yes     | Yes                 |
| IGMP Fast Leave<br>IGMP Filtering<br>IGMP Snooping<br>IGMP Version 1<br>IGMP Version 2<br>IGMP Version 3<br>IGMP Version 3 - Explicit Tracking of Hosts, Groups, and Channels | Yes      | Yes     | Yes                 |
| IGMPv3 Host Stack<br>IGMPv3 Snooping: Full Support  | Yes      | Yes     | Yes                 |
| Image Verification  | Yes      | Yes     | Yes                 |
| Individual SNMP Trap Support  | Yes      | Yes     | Yes                 |
| Inline Power Auto Negotiation   | Yes      | Yes     | Yes                 |
| Inline Power Management   | Yes      | Yes     | Yes                 |
| Interface Index Persistence   | Yes      | Yes     | Yes                 |
| Interface Range Specification   | Yes      | Yes     | Yes                 |
| Interface Templates   | Yes      | Yes     | Yes                 |
| IOS Based Device Profiling  | No       | Yes     | Yes                 |

| <b>Feature</b>  | <b>LAN Base</b> | <b>IP Base</b> | <b>Enterprise Services</b> |
|---|-----------------|----------------|----------------------------|
| IP Enhanced IGRP Route Authentication   | No              | No             | Yes                        |
| IP Event Dampening  | No              | Yes            | Yes                        |
| IP Multicast Load Splitting - Equal Cost Multipath (ECMP) using S, G and Next-hop | No              | No             | Yes                        |
| IP Multicast Load Splitting across Equal-Cost Paths                               | No              | Yes            | Yes                        |
| IP Named Access Control List  | Yes             | Yes            | Yes                        |
| IPv6 Tunnels (in software)  | No              | Yes            | Yes                        |
| IP Routing  | Yes             | Yes            | Yes                        |
| IP SLAs:<br>Distribution of Statistics  | No              | Yes            | Yes                        |

| <b>Feature</b>  | <b>LAN Base</b> | <b>IP Base</b> | <b>Enterprise Services</b> |
|---|-----------------|----------------|----------------------------|
| IP SLAs — DNS Operation<br>DNS Operation<br>FTP Operation<br>HTTP Operation<br>ICMP Echo Operation<br>ICMP Path Echo Operation<br>Multi Operation Scheduler<br>One Way Measurement<br>Path Jitter Operation<br>Random Scheduler<br>Reaction Threshold<br>Responder<br>Scheduler<br>Sub-millisecond Accuracy Improvements<br>TCP Connect Operation<br>UDP Based VoIP Operation<br>UDP Echo Operation<br>UDP Jitter Operation<br>Video Operations<br>VoIP Threshold Traps | Yes             | Yes            | Yes                        |
| IP Summary Address for RIPv2  | Yes             | Yes            | Yes                        |
| IP Unnumbered for VLAN-SVI interfaces   | No              | Yes            | Yes                        |
| IPSG (IP Source Guard) v4   | Yes             | Yes            | Yes                        |
| IPSG (IP Source Guard) v4 for Static Hosts  | Yes             | Yes            | Yes                        |
| IPv4 OGACLs   | Yes             | Yes            | Yes                        |

| Feature  | LAN Base | IP Base | Enterprise Services |
|--|----------|---------|---------------------|
| IPv4 Policy-Based Routing<br>IPv4 Policy-Based Routing with recursive next hop   | Yes      | Yes     | Yes                 |
| IPv4 Routing —Static Hosts/Default Gateway   | Yes      | Yes     | Yes                 |
| IPv6 ACL Wild Card Masking   | Yes      | Yes     | Yes                 |
| IPv6 / v4 BFD with OSPF/ BGP/ EIGRP and Static   | Yes      | Yes     | Yes                 |
| IPv6 BGP   | No       | No      | Yes                 |
| IPv6 Bootstrap Router (BSR) Scoped Zone Support  | No       | No      | Yes                 |
| IPv6 CNS Agents  | Yes      | Yes     | Yes                 |
| IPv6 Config Logger   | Yes      | Yes     | Yes                 |
| IPv6 First Hop Security (FHS):<br>DHCPv6 Guard<br>IPv6 Destination Guard<br>IPv6 Snooping (Data Gleaning, per-limit Address Limit)<br>IPv6 Neighbor Discovery (ND) Inspection<br>IPv6 Neighbor Discovery Multicast Suppression<br>IPv6 Router Advertisement (RA) Guard | Yes      | Yes     | Yes                 |



| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| IPv6 First Hop Security (FHS) Phase 2:<br>Binding table recovery<br>Lightweight DHCPv6 Relay Agent (LDRA)<br>IPv6 Snooping (Data Gleaning, per-limit Address Limit)<br>Neighbor Discovery (ND) Multicast Suppress<br>Source and Prefix Guard <sup>4</sup><br>FHS EtherChannel Support | Yes      | Yes     | Yes                 |
| IPv6 HSRP   | No       | Yes     | Yes                 |
| IPv6 HTTP(S)  | Yes      | Yes     | Yes                 |
| IPv6 ICMPv6   | Yes      | Yes     | Yes                 |
| IPv6 ICMPv6 Redirect  | Yes      | Yes     | Yes                 |
| IPv6 Interface Statistics   | Yes      | Yes     | Yes                 |
| IPv6 IP SLAs (UDP Jitter, UDP Echo, ICMP Echo, TCP Connect)   | No       | Yes     | Yes                 |
| IPv6 Static Route support for Object Tracking   | Yes      | Yes     | Yes                 |
| IPv6 TCL  | Yes      | Yes     | Yes                 |
| IPv6 Interface Statistics   | Yes      | Yes     | Yes                 |
| IPv6 Access Services: DHCPv6 Relay Agent  | No       | Yes     | Yes                 |
| IPv6: Anycast Address   | Yes      | Yes     | Yes                 |
| IPv6 MLD Snooping v1 and v2   | Yes      | Yes     | Yes                 |
| IPv6 MTU Path Discovery   | Yes      | Yes     | Yes                 |
| IPv6 Multicast  | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base          | Enterprise Services |
|---|----------|------------------|---------------------|
| IPv6 Multicast<br>—Bootstrap Router (BSR)   | No       | Yes              | Yes                 |
| IPv6 Multicast — Explicit<br>Tracking of Receivers  | No       | Yes              | Yes                 |
| IPv6 Multicast — MLD<br>Access Group  | No       | Yes              | Yes                 |
| IPv6 Multicast —<br>Multicast Listener<br>Discovery (MLD)<br>Protocol, Versions 1 and<br>2  | No       | Yes              | Yes                 |
| IPv6 Multicast:<br>PIM Accept Register<br>PIM Embedded RP<br>Support<br>PIM Source-Specific<br>Multicast (PIM-SSM)<br>PIM Sparse Mode<br>(PIM-SM) | Yes      | Yes              | Yes                 |
| IPv6 Multicast —<br>Routable Address Hello<br>Option  | No       | Yes              | Yes                 |
| IPv6 Multicast — RPF<br>Flooding of Bootstrap<br>Router (BSR) Packets   | No       | Yes              | Yes                 |
| IPv6 Multicast — Scope<br>Boundaries  | No       | Yes              | Yes                 |
| IPv6 Neighbor Discovery<br>Duplicate Address<br>Detection   | Yes      | Yes              | Yes                 |
| IPv6 OGACLs   | Yes      | Yes              | Yes                 |
| IPv6 OSPFv3 NSF/SSO   | No       | Yes <sub>4</sub> | Yes                 |
| IPv6 OSPFv3 Fast<br>Convergence   | Yes      | Yes <sub>4</sub> | Yes                 |
| IPv6 PACL   | Yes      | Yes              | Yes                 |
| IPv6 Policy-Based<br>Routing  | Yes      | No               | Yes                 |

| Feature   | LAN Base | IP Base          | Enterprise Services |
|---|----------|------------------|---------------------|
| IPv6 RA Guard (Host Mode)   | Yes      | Yes              | Yes                 |
| IPv6 Router Advertisement Options for Domain Name System (DNS) Configuration  | Yes      | Yes              | Yes                 |
| IPv6 Routing — EIGRP Support  | No       | No               | Yes                 |
| IPv6 Routing — OSPF for IPv6 (OSPFv3)   | Yes      | Yes <sup>5</sup> | Yes                 |
| IPv6 Routing — RIP for IPv6 (RIPng)   | Yes      | Yes              | Yes                 |
| IPv6 Routing — Route Redistribution   | No       | Yes              | Yes                 |
| IPv6 Routing — Static Routing   | Yes      | Yes              | Yes                 |
| IPv6 Security — Secure Shell SSH support over IPv6  | Yes      | Yes              | Yes                 |
| IPv6 Services — AAAA DNS Lookups over an IPv4 Transport   | No       | Yes              | Yes                 |
| IPv6 Services:<br>Cisco Discovery Protocol (CDP) - IPv6 Address Family Support for Neighbor Information<br>DNS Lookups over an IPv6 Transport<br>Extended Access Control Lists<br>Standard Access Control Lists | Yes      | Yes              | Yes                 |
| IPv6 Stateless Auto-configuration   | Yes      | Yes              | Yes                 |
| IPv6 Static Routing: Support for Tracking Objects   | Yes      | Yes              | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| IPv6 Support for SGT/SGACL  | Yes      | Yes     | Yes                 |
| IPv6 Switching:<br>CEF Support<br>CEFv6 Switched Automatic<br>IPv4-compatible Tunnels (in software)<br>CEFv6 Switched ISATAP Tunnels (in software)  | No       | Yes     | Yes                 |
| IPv6 Tunneling:<br>Automatic 6 to 4 Tunnels (in software)<br>Automatic IPv4-compatible Tunnels (in software)<br>IPv6 over IPv4 GRE Tunnels (in software)<br>ISATAP Tunnel Support (in software)<br>Manually Configured IPv6 over IPv4 Tunnels (in software) | No       | Yes     | Yes                 |
| IPv6 Virtual LAN Access Control List (VACL)   | Yes      | Yes     | Yes                 |
| IPsecv3/IKEv2 (for management traffic only)   | Yes      | Yes     | Yes                 |
| IS-IS for IPv4 and IPv6   | No       | No      | Yes                 |
| ISSU (IOS In-Service Software Upgrade)  | No       | Yes     | Yes                 |
| Jumbo Frames  | Yes      | Yes     | Yes                 |
| Link Aggregation Control Protocol   | Yes      | Yes     | Yes                 |
| LACP Min-Links  | Yes      | Yes     | Yes                 |
| LACP Rate Fast  | Yes      | Yes     | Yes                 |
| Layer 2 Control Packet  | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| Layer 2 Protocol Tunneling (L2PT)   | No       | Yes     | Yes                 |
| L2TP for LACP and PAgP  | No       | Yes     | Yes                 |
| L2TP for UDLD   | No       | Yes     | Yes                 |
| Layer 2 Traceroute  | No       | Yes     | Yes                 |
| Layer 3 Multicast Routing (PIM SM, SSM, Bidir)  | No       | Yes     | Yes                 |
| Link State Group  | No       | Yes     | Yes                 |
| Link State Tracking   | Yes      | Yes     | Yes                 |
| Loadsharing IP packets over more than six parallel paths  | Yes      | Yes     | Yes                 |
| Local Proxy ARP   | Yes      | Yes     | Yes                 |
| Location MIBs   | Yes      | Yes     | Yes                 |
| MAB with Configurable User Name/Password  | Yes      | Yes     | Yes                 |
| MAB for Voice VLAN  | Yes      | Yes     | Yes                 |
| MAC Address Notification  | Yes      | Yes     | Yes                 |
| MAC Authentication Bypass   | Yes      | Yes     | Yes                 |
| MAC Move and Replace  | Yes      | Yes     | Yes                 |
| Master Key Agreement (MKA) MACsec with EAP-TLS <ul style="list-style-type: none"> <li>• Switch-to Switch Connections with Pre-Shared Keys</li> <li>• Port Channels</li> </ul> | Yes      | Yes     | Yes                 |
| Medianet — AutoQoS SRND4 Macro  | No       | Yes     | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| Medianet — Integrated Video Traffic Simulator (hardware-assisted IP SLA); IPSLA generator and responder | No       | Yes     | Yes                 |
| Medianet — Flow Metadata  | No       | Yes     | Yes                 |
| Medianet — Media Service Proxy  | No       | Yes     | Yes                 |
| Medianet — Media Monitoring (Performance Monitoring and Mediatrace)                                     | No       | Yes     | Yes                 |
| Memory Threshold Notifications  | Yes      | Yes     | Yes                 |
| Microflow policers  | No       | Yes     | Yes                 |
| Modular QoS CLI (MQC)   | Yes      | Yes     | Yes                 |
| Multi-authentication and VLAN Assignment  | Yes      | Yes     | Yes                 |
| Multi-VRF Support (VRF lite)  | No       | No      | Yes                 |
| Multicast BGP (MBGP)  | No       | No      | Yes                 |
| Multicast Fast Switching Performance Improvement  | No       | Yes     | Yes                 |
| Multicast HA (NSF/SSO) for IPv4&IPv6  | No       | Yes     | Yes                 |
| Multicast Routing Monitor (MRM)   | No       | No      | Yes                 |
| Multicast Source Discovery Protocol (MSDP)  | No       | Yes     | Yes                 |
| Multicast Subsecond Convergence   | No       | Yes     | Yes                 |
| Multicast VLAN Registration (MVR)   | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| Multigigabit Ethernet Interface — Downshift Speed   | Yes      | Yes     | Yes                 |
| NAC — L2 IEEE 802.1x  | Yes      | Yes     | Yes                 |
| NAC — L2 IP   | Yes      | Yes     | Yes                 |
| Named VLAN  | Yes      | Yes     | Yes                 |
| NEAT Enhancement: Re-Enabling BPDU Guard Based on User Configuration  | Yes      | Yes     | Yes                 |
| NETCONF over SSHv2  | Yes      | Yes     | Yes                 |
| Network Edge Access Topology (NEAT)   | Yes      | Yes     | Yes                 |
| NAC — L2 IEEE 802.1x  | Yes      | Yes     | Yes                 |
| Network Time Protocol (NTP)<br>NTP primary<br>(formerly known as NTP master)  | Yes      | Yes     | Yes                 |
| Next Hop Resolution Protocol (NHRP)   | No       | No      | Yes                 |
| NMSP Enhancements <ul style="list-style-type: none"> <li>• GPS support for location</li> <li>• GPS support for location<br/>Location at switch level</li> <li>• Local timezone change</li> <li>• Name value pair</li> <li>• Priority settings for MIBs</li> </ul> | No       | Yes     | Yes                 |
| No Service Password Recovery  | Yes      | Yes     | Yes                 |

## Feature Support by Image Type

| Feature   | LAN Base | IP Base          | Enterprise Services |
|---|----------|------------------|---------------------|
| No. of VLAN Support                                       | 2048     | 4096             | 4096                |
| NSF — BGP   | No       | No               | Yes                 |
| NSF — EIGRP   | No       | Yes              | Yes                 |
| NSF — OSPF (version 2 only)                               | No       | Yes              | Yes                 |
| NSF/SSO (Nonstop Forwarding with Stateful Switchover)     | No       | Yes              | Yes                 |
| NTP for IPv6  | Yes      | Yes              | Yes                 |
| NTP for VRF aware   | No       | No               | Yes                 |
| Object Tracking: IPv6 Route Tracking                      | No       | Yes              | Yes                 |
| Onboard Failure Logging (OBFL)                            | Yes      | Yes              | Yes                 |
| Open Plug-N-Play Agent                                    | Yes      | Yes              | Yes                 |
| OSPF<br>OSPF v3 Authentication<br>OSPF Flooding Reduction | Yes      | Yes <sup>4</sup> | Yes                 |
| OSPF for Routed Access <sup>6</sup>                       | Yes      | Yes              | Yes                 |



| Feature  | LAN Base | IP Base          | Enterprise Services |
|--|----------|------------------|---------------------|
| OSPF Incremental Shortest Path First (i-SPF) Support<br>OSPF Link State Database Overload Protection<br>OSPF Not-So-Stubby Areas (NSSA)<br>OSPF Packet Pacing<br>OSPF Shortest Paths First Throttling<br>OSPF Stub Router Advertisement<br>OSPF Support for Fast Hellos<br>OSPF Support for Link State Advertisement (LSA) Throttling<br>OSPF Update Packet-Pacing Configurable Timers | Yes      | Yes <sup>4</sup> | Yes                 |
| OSPF Support for Multi-VRF on CE Routers   | No       | Yes <sup>4</sup> | Yes                 |
| PBR Support for Multiple Tracking Options<br>PBR with Object Tracking  | Yes      | Yes              | Yes                 |
| Per Intf IGMP State Limit<br>Per Intf MrouteState Limit<br>Per Port Per VLAN Policing<br>Per-User ACL Support for 802.1X/MAB/Webauth users<br>Per-VLAN Learning  | Yes      | Yes              | Yes                 |
| Permanent Right-to-Use (PRTU) license  | Yes      | Yes              | Yes                 |

| Feature                                  | LAN Base                 | IP Base                  | Enterprise Services      |
|--|--------------------------|--------------------------|--------------------------|
| PIM Dense Mode State Refresh             | Yes                      | Yes                      | Yes                      |
| PIM Multicast Scalability                |                          |                          |                          |
| PIM Version 1                            |                          |                          |                          |
| PIM Version 2                            |                          |                          |                          |
| PnP Agent                                | Yes                      | Yes                      | Yes                      |
| PoEP via LLDP                            | Yes                      | Yes                      | Yes                      |
| Port Security                            | Yes (supports 1024 MACs) | Yes (supports 3072 MACs) | Yes (supports 3072 MACs) |
| Port Security on Etherchannel Trunk Port | Yes                      | Yes                      | Yes                      |
| Port Security MAC Address Filtering      |                          |                          |                          |
| Pragmatic General Multicast (PGM)        | No                       | Yes                      | Yes                      |
| Priority Queueing (PQ)                   | Yes                      | Yes                      | Yes                      |
| Private VLAN                             | Yes                      | Yes                      | Yes                      |
| Promiscuous Trunk Port                   |                          |                          |                          |
| Private VLAN Trunk Ports                 |                          |                          |                          |
| Private VLANs                            |                          |                          |                          |
| Programmability                          | Yes                      | Yes                      | Yes                      |
| Propagation of Location Info over CDP    | Yes                      | Yes                      | Yes                      |
| PVLAN over EtherChannel                  | Yes                      | Yes                      | Yes                      |
| PVST + (Per VLAN Spanning Tree Plus)     |                          |                          |                          |
| Q-in-Q                                   | No                       | Yes                      | Yes                      |
| QoS Packet Marking                       | Yes                      | Yes                      | Yes                      |
| QoS Priority Percentage CLI Support      | No                       | No                       | No                       |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| RADIUS<br>RADIUS Attribute 44<br>(Accounting Session ID)<br>in Access Requests<br>RADIUS Change of<br>Authorization<br>Rapid PVST+ Dispute<br>Mechanism<br>Rapid-Per-VLAN-Spanning<br>Tree Plus (Rapid-PVST+)<br>Rapid-Per-VLAN-Spanning<br>Tree (Rapid-PVST) | Yes      | Yes     | Yes                 |
| Reduced MAC Address<br>Usage  | Yes      | Yes     | Yes                 |
| Redundancy Facility<br>Protoco  | Yes      | Yes     | Yes                 |
| Remote SPAN (RSPAN)   | Yes      | Yes     | Yes                 |
| REP (Resilient Ethernet<br>Protocol)<br>REP — No Edge<br>Neighbor Enhancement   | Yes      | Yes     | Yes                 |
| RIP v1  | Yes      | Yes     | Yes                 |
| RMON events and alarms  | Yes      | Yes     | Yes                 |
| RPR Mode for Catalyst<br>4500-E In-Chassis<br>Redundant Supervisors<br>with VSS   | No       | Yes     | Yes                 |
| Secure CDP<br>Secure Copy (SCP)   | Yes      | Yes     | Yes                 |
| Secure Shell SSH Version<br>2 Client Support<br>Secure Shell SSH Version<br>2 Server Support  | Yes      | Yes     | Yes                 |
| Security Group ACL at<br>Interface Level  | Yes      | Yes     | Yes                 |

| Feature  | LAN Base                       | IP Base                         | Enterprise Services             |
|--|--------------------------------|---------------------------------|---------------------------------|
| Single Rate 3-Color Marker for Traffic Policing  | Yes                            | Yes                             | Yes                             |
| Smart Port   | Yes                            | Yes                             | Yes                             |
| SNMP (Simple Network Management Protocol)<br>SNMP Inform Request<br>SNMP Manager<br>SNMPv2C<br>SNMPv3 — 3DES and AES Encryption Support<br>SNMPv3 (SNMP Version 3) | Yes                            | Yes                             | Yes                             |
| Source Specific Multicast (SSM)<br>Source Specific Multicast (SSM) - IGMPv3, IGMP v3lite, and URD<br>Source Specific Multicast (SSM) Mapping                       | No                             | Yes                             | Yes                             |
| SPAN (# of bidirectional sessions) – Port Mirroring  | Yes (4 bidirectional sessions) | Yes (16 bidirectional sessions) | Yes (16 bidirectional sessions) |
| SPAN ACL Filtering for IPv6<br>SPAN — Packet Type and Address Type Filtering   | Yes                            | Yes                             | Yes                             |

| Feature  | LAN Base | IP Base | Enterprise Services |
|--|----------|---------|---------------------|
| Spanning Tree Protocol (STP): <ul style="list-style-type: none"> <li>• Backbone Fast Convergence</li> <li>• Bridge Assurance</li> <li>• Dispute Mechanism</li> <li>• Loop Guard</li> <li>• Portfast</li> <li>• PortFast BPDU Filtering</li> <li>• Portfast BPDU Guard</li> <li>• Portfast Support for Trunks</li> <li>• PVST+ Simulation</li> <li>• Root Guard</li> <li>• STP Extension</li> <li>• Uplink Fast Convergence</li> <li>• Uplink Load Balancing</li> </ul> | Yes      | Yes     | Yes                 |
| Stateful Switchover  | Yes      | Yes     | Yes                 |
| Standard IP Access List Logging  | Yes      | Yes     | Yes                 |
| Standby Supervisor Port Usage  | Yes      | Yes     | Yes                 |
| Sticky Port Security<br>Sticky Port Security on Voice VLAN   | Yes      | Yes     | Yes                 |
| Storm Control<br>Storm Control — Per-Port Multicast Suppression  | Yes      | Yes     | Yes                 |
| STP Syslog Messages  | Yes      | Yes     | Yes                 |
| Stub IP Multicast Routing  | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base | Enterprise Services |
|---|----------|---------|---------------------|
| Sub-second UDLD   | Yes      | Yes     | Yes                 |
| SVI (Switch Virtual Interface) Autostate Exclude  | Yes      | Yes     | Yes                 |
| Switch and IP Phone Security Interaction  | Yes      | Yes     | Yes                 |
| Switch Port Analyzer (SPAN)<br>Switch Port Analyzer (SPAN) - CPU Source                         | Yes      | Yes     | Yes                 |
| Syslog over IPV6  | Yes      | Yes     | Yes                 |
| System Logging - EAL4 Certification Enhancements  | Yes      | Yes     | Yes                 |
| TACACS SENDAUTH function<br>TACACS Single Connection<br>TACACS+<br>TACACS+ and Radius for IPv6- | Yes      | Yes     | Yes                 |
| TCAM4 — Dynamic Multi-Protocol<br>TCAM4 — Service-Aware Resource Allocation                     | Yes      | Yes     | Yes                 |
| Time Domain Reflectometry (TDR) <sup>7</sup>  | Yes      | Yes     | Yes                 |
| Time-Based Access Lists<br>Time-Based Access Lists Using Time Ranges (ACL)                      | Yes      | Yes     | Yes                 |
| Trusted boundary (extended trust for CDP devices)   | Yes      | Yes     | Yes                 |
| UDI - Unique Device Identifier  | Yes      | Yes     | Yes                 |

| Feature   | LAN Base | IP Base                           | Enterprise Services                               |
|---|----------|-----------------------------------|---|
| Uni-Directional Link Routing (UDLR)   | No       | Yes                               | Yes   |
| Unicast Mac Filtering   | Yes      | Yes                               | Yes   |
| Unicast Reverse Path Forwarding (uRPF)  | No       | Yes                               | Yes   |
| Unidirectional Ethernet UniDirectional Link Detection (UDLD)  | Yes      | Yes                               | Yes   |
| UDP Forwarding Support for IP Redundancy Virtual Router Group   | Yes      | Yes                               | Yes   |
| Virtual Router Redundancy Protocol (VRRP) for IPv4  | No       | Yes                               | Yes   |
| Virtual Switching System (VSS)  | No       | Yes<br>(Sup 7-E and Sup 8-E only) | Yes<br>(Sup 7-E, Sup 7L-E, Sup 8-E, and Sup 8L-E) |
| VSS — Layer 2 Protocol Tunneling, VLAN Translation, and Q-in-Q<br>VSS — REP, Flexlinks, UDLD, Fast UDLD | No       | Yes                               | Yes   |
| Virtual Trunking Protocol (VTP) — Pruning   | Yes      | Yes                               | Yes   |
| VLAN Access Control List (VACL)<br>VLAN MAC Address Filtering   | Yes      | Yes                               | Yes   |
| VLAN Mapping (VLAN Translation)<br>VLAN Switching and Selective QinQ on the Same Port                   | No       | Yes                               | Yes   |

| Feature  | LAN Base | IP Base | Enterprise Services |
|--|----------|---------|---------------------|
| VRF-aware Copy Commands<br>VRF-aware SGT (Subnet-to-SGT mapping and VLAN-to-SGT mapping)                 | No       | Yes     | Yes                 |
| VRF-aware PBR<br>VRF-aware TACACS+<br>VRF-aware WCCP for IPv4 traffic<br>VRF-aware WCCP for IPv6 traffic | No       | No      | Yes                 |
| VRF-lite for IPv6 on OSPF/ BGP/ EIGR   | No       | No      | Yes                 |
| VRRPv3 — Object Tracking Integration<br>VRRPv3 Protocol Support  | No       | Yes     | Yes                 |
| VTP (Virtual Trunking Protocol) Version 2<br>VTP Version 3   | Yes      | Yes     | Yes                 |
| WCCP Version 2<br>WCCP Version 2 on VSS<br>WCCP Version 2 for IPv6                                       | No       | Yes     | Yes                 |
| Web Authentication Proxy<br>Web Authentication Redirection to Original URL<br>Webauth Enhancements       | Yes      | Yes     | Yes                 |
| Wired Guest Access <sup>8</sup>  | No       | Yes     | Yes                 |
| Wireshark-based Ethernet Analyzer  | No       | Yes     | Yes                 |
| XML-PI   | Yes      | Yes     | Yes                 |

<sup>2</sup>.Supervisor Engine 7-E, and Supervisor Engine 8-E, Supervisor Engine 8L-E; IP Base. Supervisor Engine 7L-Ent Services



|  |
|--|
| <sup>3</sup> IEEE 802.1t—An IEEE amendment to IEEE 802.1D that includes extended system ID, long path cost, and PortFast.  |
| <sup>4</sup> 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 |
| <sup>5</sup> IP Base supports only one OSPFv2 and one OSPFv3 instance with a maximum number of 200 dynamically learned routes.   |
| <sup>6</sup> OSPF for Routed Access supports only one OSPFv2 and one OSPFv3 instance with a maximum number of 1000 dynamically learned routes.   |
| <sup>7</sup> TDR is not supported on 46xx linecards.   |
| <sup>8</sup> Wired Guest Access is supported only in wireless mode on Supervisor Engine 8-E, when the switch functions as a mobility agent and or a mobility controller.   |

## OpenFlow Version and Cisco IOS Release Support

The following table provides OpenFlow compatibility information for the Cisco Catalyst 4500-E Series Switches. The OVA package is available for download in the same location as your system image (.bin) file, on cisco.com.



**Note** The OVA package is compatible only with its corresponding system image file name - as listed in the table below. Do not use an older version of the OVA package with a newer system image file, or a newer OVA package with an older system image file.

**Table 6: Image Support for OpenFlow Version and Cisco IOS Release Support for Cisco OpenFlow Plug-In**

| Platform  | Cisco IOS Release | Cisco OpenFlow Plug-In Version | Cisco OpenFlow Plug-In | Image Name           |
|---|-------------------|--------------------------------|------------------------|----------------------|
| Cisco Catalyst 4500E Series Switches with Supervisor Engine 9-E       | IOS XE 3.11.0E    | 2.0.2                          | of202-c450sSPA19.oa    | c450s-ica-SPC110E57H |
| Cisco Catalyst 4500E Series Switches with Supervisor Engine 8L-E, 8-E | IOS XE 3.11.0E    | 2.0.2                          | of202-c450sSPA19.oa    | c450s-ica-SPC110E57H |
| Cisco Catalyst 4500E Series Switches with Supervisor Engine 7L-E, 7-E | IOS XE 3.11.0E    | 2.0.2                          | of202-c450sSPA19.oa    | c450s-ica-SPC110E57H |

## 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-E Series Switch

The following features are not supported on a Catalyst 4500-E series switch with Supervisor Engine 7-E and Supervisor Engine 7L-E:

- CISCO-IETF-IP-FORWARD-MIB
- CISCO-IETF-IP-MIB
- LLDP HA
- WCCP Version 1
- SSH Version 1

## Orderable Product Numbers

The following table lists the Cisco IOS XE Release 3.11.xE Product Numbers and Images for the Catalyst 4500-E Series Switch

| Product Number  | Description  | Image                     |
|-----------------|--|---------------------------|
| S45EULPE-S8-38E | CAT4500e SUP8-E /SUP8L-E<br>Universal NoMACSEC Image | cat4500es8-universalk9npe |
| S45EUK9-S8-38E  | CAT4500e SUP8-E/SUP8L-E<br>Universal Crypto Image    | cat4500es8-universalk9    |
| S45EUK9-S7-38E  | CAT4500e SUP7-E/SUP7L-E<br>Universal Crypto Image    | cat4500e-universalk9      |
| S45EUN-S7-38E   | CAT4500e SUP7-E/SUP7L-E<br>Universal No MACSEC Image | cat4500e-universalk9np    |
| S45EU-S8-38E    | CAT4500e SUP8L-E Universal<br>Image                  | cat4500es8-universal      |
| S45EU-S7-38E    | CAT4500e SUP7-E/SUP7L-E<br>Universal Image           | cat4500e-universal        |

## New and Changed Information

These sections describe the new and changed information for Cisco Catalyst 4500E Series Switches running Cisco IOS XE software:

## New Features in Cisco IOS XE Release 3.11.10E

### New Software Features

None.

## New Features in Cisco IOS XE Release 3.11.9E

### New Software Features

None.

## New Features in Cisco IOS XE Release 3.11.8E

### New Software Features

| Feature          | Description  |
|------------------|--|
| Secure Data Wipe | Introduces support for performing factory reset by using the keyword <b>all secure</b> in the <b>factory-reset</b> command. This option performs data sanitisation and securely resets the device. |

## New Features in Cisco IOS XE Release 3.11.7E

None.

## New Features in Cisco IOS XE Release 3.11.6E

None.

## New Features in Cisco IOS XE Release 3.11.5E

None.

## New Features in Cisco IOS XE Release 3.11.4E

None.

## New Features in Cisco IOS XE Release 3.11.3aE

### New Software Features

| Feature                                    | Description   |
|--|---|
| Support for Type 6 AES Encryption password | <p>Beginning with this release, you can specify a Type 6 encrypted key for a TACACS Server.</p> <p>The new command is <b>tacacs server key 6</b> <i>key-name</i>.</p> <p><b>Note</b> Before downgrading from Cisco IOS XE Release 3.11.3aE to an earlier release, ensure that Type 6 encryption is removed from the TACACS Server. (Type 6 encryption is not supported in releases earlier than Cisco IOS XE Release 3.11.3aE.)</p> |

## New Features in Cisco IOS XE Release 3.11.2E

None.

## New Features in Cisco IOS XE Release 3.11.1E

### New Software Features in IOS XE 3.11.1E

| Feature Name          | Description  |
|-----------------------|--|
| Support for IPv6 DACL | This release supports downloadable ACLs for devices with IPv6 address. You can download the authorization policies from the Identity Services Engine (ISE) server. |

## New Features in Cisco IOS XE Release 3.11.0E

### New Software Features

| Feature Name                       | Description   |
|------------------------------------|---|
| SSH File Transfer Protocol Support | Secure Shell (SSH) includes support for SSH File Transfer Protocol (SFTP), a new standard file transfer protocol introduced in SSHv2. This feature provides a secure and authenticated method for copying device configuration or device image files. |
| PVLAN Support with Multicast       | Multicast traffic is now supported with PVLAN. Multicast traffic is routed or bridged across private-VLAN boundaries and within a single community VLAN.  |

## Cisco IOS XE to Cisco IOS

Each version of Cisco IOS XE has an associated Cisco IOS version:

**Table 7: Cisco IOS XE to Cisco IOS**

| Cisco IOS XE Version | Cisco IOS Version | Cisco Wireless Control Module Version | Access Point Version |
|----------------------|-------------------|---------------------------------------|----------------------|
| 03.1.0SG             | 15.0(1)XO         | -                                     | -                    |
| 03.1.1SG             | 15.0(1)XO1        | -                                     | -                    |
| 03.2.0SG             | 15.0(2)SG         | -                                     | -                    |
| 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          | -                                     | -                    |
| 03.7.0E              | 15.2(3)E          | 10.3.100.0                            | 15.3(3)JNB           |
| 03.8.0E              | 15.2(4)E          | 10.3.100.0                            | 15.3(3)JNB           |
| 03.8.1E              | 15.2(4)E1         | 10.4.111.0                            | 15.3(3)JNC1          |
| 03.9.0E              | 15.2(5)E          | 10.5.100.0                            | 15.3(3)JND           |
| 03.10.0E             | 15.2(6)E          | -                                     | -                    |
| 03.10.1E             | 15.2(6)E1         | -                                     | -                    |
| 03.10.2E             | 15.2(6)E2         | -                                     | -                    |
| 03.11.0E             | 15.2(7)E          | -                                     | -                    |
| 03.11.1E             | 15.2(7)E1         | -                                     | -                    |
| 03.11.1aE            | 15.2(7)E1a        | -                                     | -                    |
| 03.11.2E             | 15.2(7)E2         | -                                     | -                    |
| 03.11.3aE            | 15.2(7)E3         | -                                     | -                    |
| 03.11.4E             | 15.2(7)E4         | -                                     | -                    |
| 03.11.5E             | 15.2(7)E5         | -                                     | -                    |
| 03.11.6E             | 15.2(7)E6         | -                                     | -                    |

## Upgrading the System Software

For details about the required ROMMON version and to know how to upgrade the ROMMON, refer to:

[http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/release/note/OL\\_30306-01.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/release/note/OL_30306-01.html)

Follow these guidelines:

- Before upgrading to Cisco IOS XE Release 3.11.3aE, ensure the following:
  - Remove the **tacacs-server** command configuration using its **no** form.
  - Configure the TACACS Server using the new **tacacs server** command.
  - If the TACACS group server is configured using the **server-private** CLI, unconfigure the private server and configure a public server using the **server name server-name** command.
- If you are upgrading to Cisco IOS XE Release 3.9.xE and using Supervisor Engine 8L-E, you must upgrade to ROMMON 15.1(1r)SG6 before upgrading the IOS-XE image to 3.9.0E or newer versions.
- If you are upgrading to Cisco IOS XE Release 3.9.xE and plan to use VSS, you must upgrade your ROMMON to version 15.0(1r)SG10. Otherwise, you must upgrade your ROMMON to at least Version 15.0(1r)SG2.
- If you are upgrading to Cisco IOS XE Release 3.9.xE and using Supervisor Engine 7-E or 7L-E, we recommend that you use ROMMON version 15.0(1r)SG10 or a higher version (if available).
- If you are upgrading to Cisco IOS XE Release 3.9.xE and using Supervisor Engine 8-E, we recommend that you use ROMMON version 15.1(1r)SG5 or later version (if available).
- If dual supervisor engines are present, first upgrade your software to Cisco IOS XE 3.2.0SG or higher, then upgrade your ROMMON to version 15.0(1r)SG7 to avoid an uplinks issue (CSCtj54375).
- Do not perform a ROMMON upgrade and a system software (IOS) upgrade together, if it involves an RPR failover. After such an upgrade, one of the Supervisor's interface configurations are lost (CSCvu66041).

We recommend that you use an ISSU compatible IOS image for an IOS upgrade that is done along with a ROMMON upgrade. To display the ISSU compatibility matrix data between two software images on a given system, use the **show issu comp-matrix stored** command.

### Identifying Hardware Revisions on the Switch Chassis

The hardware revision is a number that represents a hardware upgrade. Enter the **show idprom chassis** privileged EXEC command on the switch chassis to know its current revision number.

Some chassis require a certain hardware revision to be operable with certain devices. For example, the Cisco Catalyst 4507R-E Switch chassis must have hardware revision 2.0 or higher to support Supervisor Engine 8-E or 8L-E. Before you install Supervisor Engine 8-E or 8L-E on the Catalyst 4507R-E Switch chassis, verify that the chassis has the required revision number.

The following is a sample output of the **show idprom chassis** command on a Catalyst 4507R-E Switch. Note the “Hardware Revision” field here is “2.0”:

```
Switch# show idprom chassis
Chassis Idprom :
  Common Block Signature = 0xABAB
```

```

Common Block Version = 3
Common Block Length = 144
Common Block Checksum = 3874
Idprom Size = 256
Block Count = 4
FRU Major Type = 0x4001
FRU Minor Type = 52
OEM String = Cisco
Product Number = WS-C4507R-E
Serial Number = FOX1224G5ZH
Part Number = 73-9975-04
Part Revision = D0
Manufacturing Deviation String =
Hardware Revision = 2.0
Top Assembly Number = 800-26494-01
Top Assembly Revision Number = D0
<output truncated>

```

## Limitations and Restrictions

- In Cisco IOS XE Release 3.11.3aE and later releases, SSH is enabled by default to connect to networks, and Telnet is disabled by default.
- TACACS legacy command: Do not configure the legacy **tacacs-server host** command; this command is deprecated. If the software version running on your device is Cisco IOS XE 3.11.3aE or a later release, using the legacy command can cause authentication failures. Use the **tacacs server** command in global configuration mode.
- RADIUS Server legacy command: In Cisco IOS XE Release 3.8.7E, the legacy **radius-server host** command is deprecated. Use the **radius server host** command if the software running on your device is Cisco IOS XE Release 3.8.7E or later.
- During an ISSU downgrade from IOS XE 3.11.1E to IOS XE 03.08.09 version, the standby is loaded with the main image. This is due to failure of configuration synchronization on device tracking and ACL.

### Workaround:

- Before an ISSU downgrade, revert the device-tracking CLI to legacy CLI:
 

```

Device# configure terminal
Device(config)# device-tracking upgrade-cli revert

```
- Before an ISSU downgrade, delete the numbered ACLs from the primary and reapply them after the downgrade process.
- ISSU or Fast Software Upgrade (FSU) limitations:
  - When upgrading to Cisco IOS XE Release 3.11.0E, or Cisco IOS XE Release 3.8.7E, or Cisco IOS XE Release 3.10.2E with ISSU or FSU, if you are using a multi-Gigabit Ethernet linecard, reload the linecard after the upgrade to avoid interface issues.
  - When downgrading from Cisco IOS XE Release 3.11.0E and later, or Cisco IOS XE Release 3.8.7E and later, or Cisco IOS XE Release 3.10.2E and later with ISSU or FSU, if you are using a multi-Gigabit Ethernet linecard, reload the linecard after upgrade to avoid interface issues.
- Starting with Cisco IOS XE Release 3.9.0E, Secure Shell (SSH) Version 1 is deprecated. Use SSH Version 2 instead.

- The maximum MTE supported on Catalyst 4500 switches is 8000, per direction.
- Although the **show memory** command is supported on Catalyst 4500 series switches, the CLI output for the command shows the value 0 for 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)
- The system allows you to delete policy maps related to these Auto QoS profiles:
  - Auto QoS enterprise
  - Auto QoS guest
  - blank.gif Auto QoS voice

The problem is seen on a Catalyst 4500 series switch running Cisco IOS-XE release 3.7.0E, when you configure QoS using Auto QoS and you try to delete an Auto QoS profile related policy map.

**Workaround** : To recover the deleted policy-map, remove all the policies related to that profile, remove Auto QoS configuration from the WLAN, and then reconfigure Auto QoS.

- Dot1x PEAP based authentication for wireless clients on Supervisor Engine 8-E is 3 auths/sec.
- Indirectly connected access points are not supported. Only access points directly connected to a trunk or access port is supported. On connecting more than one AP the following error message will be seen:
 

```
3. Dec 5 03:57:24.121: %CAPWAP-3-ONE_AP_PER_PORT: AP (mac:6c20.56a6.4fc4) is not allowed
on port:Po2. Only one AP per port is allowed.
```
- RPR mode cannot be configured when Supervisor Engine 8-E is booted in wireless mode.
- Flow Sampling is not supported on Supervisor Engine 8-E.
- Supported QoS features on wireless targets: The detailed QoS policy is the same as mentioned [here](#), except that the port policy cannot be changed because it is a DC-interconnect port.
- VSS: Do not use SVLAN for routing in SP network on ingress switch (where the mapping is present). This is not a valid scenario.
- VSS is not supported in Wireless mode, on Supervisor Engine 8-E.
- Wired guest access does not work on Supervisor Engine 8-E, in multi-host or multi-authentication mode.
- The show exception files all command lists only crashinfo files from the active supervisor engine. You must issue the dir slavecrashinfo: and dir slavecrashinfo-dc: commands to obtain lists of crashinfo files from the standby supervisor engine.
- Performing an ISSU from a prior release to IOS XE 3.6.0E is not supported.
- The WS-X4712-SFP+E module is not supported in the WS-C4507R-E or WS-C4510R-E chassis and does not boot. This module is supported in the WS-C4503-E, WS-C4506-E, WS-C4507R+E, and WS-C4510R+E chassis.
- 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 (LAN Base, 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.

- An 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" />
```

produces 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 a 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 causes 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

- 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

- On the following linecards running IOS XE Release 3.2.3:

– 10/100/1000BaseT Premium POE E Series WS-X4648-RJ45V+E (JAE1348OY52)

– 4 Sup 7-E 10GE (SFP+), 1000BaseX (SFP) WS-X45-SUP7-E (CAT1434L0G4)

the following restrictions apply:

– Sub-interfaces are not supported on 1 Gigabit and Ten-Gigabit interfaces.

– Port-channel members do not support multiple classification criteria for a QoS policy.

– CEF is disabled automatically when uRFP is enabled and TCAM is fully utilized.

- 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

- Dual connectors (like, an SFP+ transceiver inserted into a CVR-X2-SFP10G module) on the WS-X4606-X2-E line card are not supported as a VSL.

Workaround: Use any X2-pluggable module on its own in the WS-X4606-X2-E line card. CSCuc70321

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

Workaround: None. CSCuc77376

- The show interface capabilities command output does not show the correct linecard model.

Workaround: Observe the show module command output. CSCua79513

- 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-dsl307
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

- When a logging discriminator is configured and applied to a device, memory leak is seen under heavy syslog or debug output. The rate of the leak is dependent on the quantity of logs produced. In extreme cases, the device may crash. As a workaround, disable the logging discriminator on the device (CSCur45606, CSCur28336).

## Caveats

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

### Cisco Bug Search Tool

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

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

### Open Caveats in Cisco IOS XE Release 3.11.10E

None.

### Resolved Caveats in Cisco IOS XE Release 3.11.10E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCwf54007</a> | Cisco IOS and IOS XE Software IS-IS Denial of Service Vulnerability |

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCwe55871</a> | Cisco IOS and Cisco IOS XE Software Command Authorization Bypass Vulnerability |

## Open Caveats in Cisco IOS XE Release 3.11.9E

None.

## Resolved Caveats in Cisco IOS XE Release 3.11.9E

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCwh38827</a> | C4500X: Traffic impacted via tunnel when upgrading to 3.11.x version |

## Open Caveats in Cisco IOS XE Release 3.11.8E

None.

## Resolved Caveats in Cisco IOS XE Release 3.11.8E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCwa34310</a> | Cisco IOS and IOS XE Software IPv6 DHCP (DHCPv6) Client Denial of Service Vulnerability |

## Open Caveats in Cisco IOS XE Release 3.11.7E

None.

## Resolved Caveats in Cisco IOS XE Release 3.11.7E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvp12187</a> | Standby switch crash because of memory leak due to Switch Integrated security feature.            |
| <a href="#">CSCwc66348</a> | RBACL not downloaded on previously shutdown port.   |
| <a href="#">CSCvw60355</a> | DHCPv6: Memory allocation of DHCPv6 relay option results in crash.                                |
| <a href="#">CSCvx63027</a> | Cisco IOS and IOS XE Software SSH Denial of Service Vulnerability.                                |
| <a href="#">CSCwa96810</a> | Cisco IOS and IOS XE Software Common Industrial Protocol Request Denial of Service Vulnerability. |

## Open Caveats in Cisco IOS XE Release 3.11.6E

None.

## Resolved Caveats in Cisco IOS XE Release 3.11.6E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCwa22165</a> | Incorrect access list logging during SSH session.   |
| <a href="#">CSCvz22651</a> | Memory leak due to csmControllerStatistics on Cisco Catalyst 4000 Series Switches.                                |
| <a href="#">CSCvz09717</a> | Cisco Catalyst 4500 -PC connected to a standby VSS switch is not getting the IP address post user authentication. |
| <a href="#">CSCvz42464</a> | Cisco QSFP-40G-LR4 incompatible with WS-X45-SUP9-E.   |

## Open Caveats in Cisco IOS XE Release 3.11.5E

None.

## Resolved Caveats in Cisco IOS XE Release 3.11.5E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvg65857</a> | link debounce CLI disappears when shut member port in LAG.  |
| <a href="#">CSCvw75254</a> | C4500X TX-Queue zeroed out on VSL.  |
| <a href="#">CSCvx36584</a> | Intermittent working of PBR on 4500 with GRE tunnel as next hop.                                      |
| <a href="#">CSCvx43251</a> | ZTP fails to configure c4500e with dual-SUP when in-band port are used to reach the DHCP/TFTP server. |
| <a href="#">CSCvx47020</a> | Segmentation fault in CMI IOSd task when running multicast.   |
| <a href="#">CSCvx56995</a> | once posture ACL is un-installed (post CoA), open-dir-acl wont get applied.                           |
| <a href="#">CSCvx94899</a> | EAP-MSCHAPv2 isn't compliant with response size.  |
| <a href="#">CSCvy12052</a> | Catalyst Switch crashes @ sisf_sw_policy_detach_target.   |
| <a href="#">CSCvy17077</a> | RxErrorBytes on certain superports following an LC reload.  |
| <a href="#">CSCvy67787</a> | C4510RE Etherchannel ports on dual Supervisors go to suspended mode after switchover.                 |

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCvx76066</a> | Switch crashes due to "HTTP Core".   |
| <a href="#">CSCvx66699</a> | Cisco IOS and IOS XE Software TrustSec CLI Parser Denial of Service Vulnerability. |

## Open Caveats in Cisco IOS XE Release 3.11.4E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvx36584</a> | Intermittent working of PBR on 4500 with GRE tunnel as next hop                 |
| <a href="#">CSCvx47020</a> | Segmentation fault in CMI IOSd task when running multicast                      |
| <a href="#">CSCvx56995</a> | once posture ACL is un-installed (post CoA), open-dir-acl wont get applied      |
| <a href="#">CSCvx66968</a> | C4500 relay agent drops DHCP offer when certain relay agent settings configured |

## Resolved Caveats in Cisco IOS XE Release 3.11.4E

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCvu24091</a> | GLC-T /TE not linking up sometimes on BOOTUP   |
| <a href="#">CSCvv25129</a> | 3.11.2 - Cat4500X may crash unexpected when trying to program IPv6 to SGT mapping                    |
| <a href="#">CSCvv54294</a> | IPDT probe uses physical interface MAC as source instead of SVI MAC in 3.11.x release                |
| <a href="#">CSCvv56133</a> | 4500x in VSS may see VSL links in an up/down state after reboot when using Twin-ax cables            |
| <a href="#">CSCvv86851</a> | TACACS not working if TACACS group server has "server-private <ip> key <passw>" in 15.2(7)E3/3.11.3E |
| <a href="#">CSCvv93417</a> | Stack Member Switch fails wired dot1x; MasterSwitch passes dot1x using the same configs              |
| <a href="#">CSCvw45946</a> | Cat4K multicast stop after REP node power cycle  |
| <a href="#">CSCvw48485</a> | K5L2 crash while fetching RET entry due to NULL entry.   |
| <a href="#">CSCvx09751</a> | Tracebacks seen after ISSU upgrade from 3.8.8 to 3.11.2E on 4500                                     |

## Open Caveats in Cisco IOS XE Release 3.11.3aE

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCvu24091</a> | GLC-T /TE not linking up sometimes on BOOTUP               |
| <a href="#">CSCvv79624</a> | Interface does not come up when monitor session is removed |



## Resolved Caveats in Cisco IOS XE Release 3.11.3aE

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvv76539</a> | 1G CTS enabled links from Cat4K experience instability                                      |
| <a href="#">CSCvs06645</a> | %C4K_L2MAN-6-INVALIDSOURCEADDRESSPACKET: packets are forwarded to clients                   |
| <a href="#">CSCvs77826</a> | Not able to scale beyond about 8K SGACLs on 4500, Traceback thrown for installation failure |
| <a href="#">CSCvt06123</a> | C4500 Standby VSS Switch Crashing at XDR receive process                                    |
| <a href="#">CSCvt09648</a> | SGT propagation fails after sup failover  |
| <a href="#">CSCvt12683</a> | HTTP redirect doesn't work on 152-7.E1  |
| <a href="#">CSCvt23492</a> | c4500x VSS standby switch rapid memory exhaustion in IOSd due to process "MFIB_Cable"       |
| <a href="#">CSCvt32280</a> | GLC-TE on Cat4500X VSS sometimes may not link up after reload                               |
| <a href="#">CSCvu07615</a> | Switches downstream of a Cat4k using 1g ports may see giants in the form of 1526B frames    |
| <a href="#">CSCvu68040</a> | C4500 No STP PVID inconsistent state when there is native vlan mismatch                     |
| <a href="#">CSCvu10399</a> | Cisco IOS and IOS XE Software Information Disclosure Vulnerability                          |
| <a href="#">CSCvv00134</a> | VTY telnet disable, enable ssh based on platform request                                    |

## Open Caveats in Cisco IOS XE Release 3.11.2E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvt23492</a> | c4500x VSS standby switch rapid memory exhaustion in IOSd due to process "MFIB_Cable" |
| <a href="#">CSCvt28484</a> | Cat4500X VSS may crash unexpected when program ACL's to TCAM                          |
| <a href="#">CSCvt32280</a> | GLC-TE on Cat4500X VSS sometimes may not link up after reload                         |

## Resolved Caveats in Cisco IOS XE 3.11.2E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvr87400</a> | 4500X : GLC-TE sometimes may not link up after reload   |
| <a href="#">CSCvs58656</a> | "vlan internal allocation policy" not displayed in show running-config all                        |
| <a href="#">CSCvs62898</a> | Sup7L-E crash with "show platform hardware qos interface cpu tx-queue [dbl   scheduling]" command |

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvs63040</a> | DAACL sent by the server that is not processed correctly by the switches 4500 |
| <a href="#">CSCvs83434</a> | DHCPv6 does not work due to LDRA  |

## Resolved Caveats in Cisco IOS XE 3.11.1aE

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvi48253</a> | Self-signed certificates expire on 00:00 1 Jan 2020 UTC, can't be created after that time |

## Open Caveats in Cisco IOS XE Release 3.11.2E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvt23492</a> | c4500x VSS standby switch rapid memory exhaustion in IOSd due to process "MFIB_Cable" |
| <a href="#">CSCvt28484</a> | Cat4500X VSS may crash unexpected when program ACL's to TCAM                          |
| <a href="#">CSCvt32280</a> | GLC-TE on Cat4500X VSS sometimes may not link up after reload                         |

## Resolved Caveats in Cisco IOS XE 3.11.1E

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCut66603</a> | Device stuck on 4500X VSS during Rommon version upgrade                                  |
| <a href="#">CSCvi66577</a> | Crash due null pointer after CISCO SFP failed the Gbic Integrity Check                   |
| <a href="#">CSCvi66866</a> | Crash while polling of dot1dStaticEntry  |
| <a href="#">CSCvk11391</a> | Upgrade to 3.8.6 continuously reloads STANDBY supervisor in VSS                          |
| <a href="#">CSCvk57096</a> | GLC-T Not Functioning in Ports 1, 5, 9, 13 on 4500X-16 in VSS standby                    |
| <a href="#">CSCvk74432</a> | AFTER ADDING NEW VLAN IN REP SEGMENT THERE IS A LAYER 2 LOOP                             |
| <a href="#">CSCvm90630</a> | 4500 forwards traffic on BKN interface   |
| <a href="#">CSCvn71215</a> | Missing PBr config causes crash on L3 rewrite  |
| <a href="#">CSCvo07490</a> | VSS switchover results in REP failure warnings   |
| <a href="#">CSCvo08913</a> | Can't ISSU from 3.8.6E to 3.10.2E due to an inconsistency between the Active and Standby |
| <a href="#">CSCvo09436</a> | Cat4510 SUP8E - Active crashing while DFE training on Standby SUP                        |
| <a href="#">CSCvo24813</a> | WS-C4510R+E / Dual WS-X45-SUP8-E / Crash when configuring flow exporter                  |

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvo35887</a> | CAT 4K Crashes Due to Watchdog Timeout When Opening Console TTY Session                     |
| <a href="#">CSCvo86432</a> | Crash due to invalid entry in FIB Adjacency Table.  |
| <a href="#">CSCvp11516</a> | 4500X with ACL config will crash when copying configuration                                 |
| <a href="#">CSCvp24671</a> | H/W mac address table learn wrong mac on C4500X VSS with active Flexlink shut/no shut       |
| <a href="#">CSCvp33074</a> | Cat4500 crashes due to multicast  |
| <a href="#">CSCvp34354</a> | 4500X with GLC-TE sometimes may not link up after reload on 3.11.0E                         |
| <a href="#">CSCvp76408</a> | Unable to generate RSA keys as long as a 46xx module ins installed in the chassis with SUP9 |
| <a href="#">CSCvq30648</a> | C4500 03.11.00.E (15.2(7)E) SNMP crash due to mediatrace config                             |
| <a href="#">CSCvq35190</a> | DAACL abnormal remove due to SISF.  |
| <a href="#">CSCvq39976</a> | SNMP Mac Move notification trap displays same interface ID for FromPortId and ToPortId      |
| <a href="#">CSCvq90033</a> | Multi-gig ports having connectivity issues on 4507/4510 switches on 3.11 code               |
| <a href="#">CSCvq95472</a> | Commands returning invalid PRC  |
| <a href="#">CSCvr23923</a> | Crash is observed after OIR or module reset of Mortis-CR PPLT linecards                     |
| <a href="#">CSCvr55005</a> | Incorrect CTS tag sticks to flow, even when that tag is no more seen with flow              |

## Open Caveats in Cisco IOS XE Release 3.11.0E

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCvi66866</a> | Crash while polling of dot1dStaticEntry                          |
| <a href="#">CSCvo83116</a> | QuadSup VSS : Standby goes to disabled mode after 2nd switchover |

## Resolved Caveats in Cisco IOS XE 3.11.0E

| Caveat ID Number           | Description   |
|----------------------------|---|
| <a href="#">CSCvm90630</a> | 4500 forwards traffic on BKN interface  |
| <a href="#">CSCvm96180</a> | Cat4500 switch reboots unexpectedly after certain Netflow configuration is pushed via SSH |
| <a href="#">CSCvn71215</a> | Missing PBR config causes crash on L3 rewrite   |

| Caveat ID Number           | Description  |
|----------------------------|--|
| <a href="#">CSCvn71260</a> | Catalyst 4500 - CTS policy is not deleted in Hardware eventhough it is actually deleted. |
| <a href="#">CSCvo07490</a> | VSS switchover results in REP failure warnings   |
| <a href="#">CSCvo09436</a> | Cat4510 SUP8E - Active crashing while DFE training on Standby SUP                        |

## Related Documentation

Refer to the Cisco Catalyst 4500E Series Switches Documentation Home for information:

<https://www.cisco.com/c/en/us/support/switches/catalyst-4500-series-switches/tsd-products-support-series-home.html>

### Hardware Documents

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

- Catalyst 4500 E-series Switches Installation Guide  
<http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/hardware/catalyst4500e/installation/guide/Eseries.html>
- For information about individual switching modules and supervisors, refer to the *Catalyst 4500 Series Module Installation Guide* at:  
[http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/hardware/configuration/notes/OL\\_25315.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/hardware/configuration/notes/OL_25315.html)
- 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)

### Software Documentation

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

- Release Notes—Cisco IOS Release Notes for the Catalyst 4500-E Series Switches are available at:  
<http://www.cisco.com/c/en/us/support/switches/catalyst-4500-series-switches/products-release-notes-list.html>
- Guides—The Catalyst 4500-X Series Switches, and the Catalyst 4500-E Series Switches, leverage the same software configuration guide and command reference guide:
  - Software Configuration Guides:

[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)

[https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/XE3-10-0E/wireless/b\\_sda/fabric-enabled-wireless.html](https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/XE3-10-0E/wireless/b_sda/fabric-enabled-wireless.html)

– Command Reference Guides: [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)

### Cisco IOS Documentation

Platform- independent Cisco IOS documentation is available at the following URL:

Cisco IOS configuration guides, Cisco IOS XE Release 3E: <http://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-xe-3e/products-installation-and-configuration-guides-list.html>

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