



## **Release Notes for Cisco Catalyst 9200 Series Switches, Cisco IOS XE 17.14.x**

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# CHAPTER 1

## Introduction

Cisco Catalyst 9200 Series Switches are entry level enterprise-class access switches that extend the power of intent-based networking and Cisco Catalyst 9000 Series Switches hardware and software innovation to a broader scale of deployments. These switches focus on offering features for the mid-market and simple branch deployments. With its family pedigree, Cisco Catalyst 9200 Series Switches offer simplicity without compromise - it is secure, always on and provides IT simplicity.

As a foundational building block for Cisco Digital Network Architecture, this platform is built with security, mobility, cloud and IoT at its core. This gives you out of the box upgrades in security, resiliency and programmability regardless of where you are in the intent-based networking journey.

With access to Cisco's best in class security portfolio anchored trustworthy solutions, MACsec encryption and segmentation, the platform provides advanced security features that protect the integrity of the hardware as well as the software and all data that flows through the switch and the network. These switches provide enterprise-level resiliency and keep your business up and running seamlessly with field-replaceable power supplies and fans, modular uplinks, cold patching, perpetual PoE, and the industry's highest mean time between failures (MTBF). Combine the application visibility of full flexible NetFlow with telemetry and the open APIs of Cisco IOS XE and programmability of the UADP ASIC technology and these switches give you the best simple experience provisioning and managing your network now with investment protection on future innovations.

- [Supported Hardware, on page 1](#)

## Supported Hardware

### Cisco Catalyst 9200 Series Switches—Model Numbers

The following table lists the supported hardware models and the default license levels they are delivered with. For information about the available license levels, see section *License Levels*.

Switch Model	Default License Level <sup>1</sup>	Description
C9200-24T-A	Network Advantage	Stackable 24x1G ports; 4x1G and 4x10G fixed uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-24T-E	Network Essentials	

Switch Model	Default License Level <sup>1</sup>	Description
C9200-24P-A	Network Advantage	Stackable 24x1G PoE+ ports; 4x1G and 4x10G fixed uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-24P-E	Network Essentials	
C9200-24PB-A	Network Advantage	Stackable 24x1G PoE+ ports; 4x1G and 4x10G fixed uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-48T-A	Network Advantage	Stackable 48x1G ports; 4x1G and 4x10G fixed uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-48T-E	Network Essentials	
C9200-48P-A	Network Advantage	Stackable 48x1G PoE+ ports; 4x1G and 4x10G fixed uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-48P-E	Network Essentials	
C9200-48PL-A	Network Advantage	Stackable 48x1G PoE+ ports with partial PoE support; 4x1G and 4x10G network modules for uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-48PL-E	Network Essentials	
C9200-48PB-A	Network Advantage	Stackable 48x1G PoE+ ports; 4x1G and 4x10G fixed uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-24PXG-E	Network Essentials	Stackable 8 Multigigabit Ethernet and 16x1G PoE+ ports; supports 4x10G, 2x25G and 2x40G network modules for uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-24PXG-A	Network Advantage	
C9200-48PXG-E	Network Essentials	Stackable 8 Multigigabit Ethernet and 40x1G PoE+ ports; supports 4x10G, 2x25G and 2x40G network modules for uplink ports; 2 power supply slots; 2 field-replaceable fans; supports StackWise-160.
C9200-48PXG-A	Network Advantage	
C9200L-24P-4G-A	Network Advantage	Stackable 24x1G PoE+ ports; 4x1G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-24P-4G-E	Network Essentials	
C9200L-24P-4X-A	Network Advantage	Stackable 24x1G PoE+ ports; 4x10G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-24P-4X-E	Network Essentials	
C9200L-24T-4G-A	Network Advantage	Stackable 24x1G ports; 4x1G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-24T-4G-E	Network Essentials	
C9200L-24T-4X-A	Network Advantage	Stackable 24x1G ports; 4x10G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-24T-4X-E	Network Essentials	

Switch Model	Default License Level <sup>1</sup>	Description
C9200L-48P-4G-A	Network Advantage	Stackable 48x1G PoE+ ports; 4x1G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48P-4G-E	Network Essentials	
C9200L-48P-4X-A	Network Advantage	Stackable 48x1G PoE+ ports; 4x10G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48P-4X-E	Network Essentials	
C9200L-48PL-4G-A	Network Advantage	Stackable 48x1G PoE+ ports with partial PoE support; 4x1G SFP fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48PL-4G-E	Network Essentials	
C9200L-48PL-4X-A	Network Advantage	Stackable 48x1G PoE+ ports with partial PoE support; 4x10G SFP fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48PL-4X-E	Network Essentials	
C9200L-48T-4G-A	Network Advantage	Stackable 48x1G ports; 4x1G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48T-4G-E	Network Essentials	
C9200L-48T-4X-A	Network Advantage	Stackable 48x1G ports; 4x10G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48T-4X-E	Network Essentials	
C9200L-24PXG-4X-A	Network Advantage	Stackable 8xMultigigabit Ethernet PoE+ ports and 16x1G PoE+ ports; 4x10G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-24PXG-4X-E	Network Essentials	
C9200L-24PXG-2Y-A	Network Advantage	Stackable 8xMultigigabit Ethernet PoE+ ports and 16x1G PoE+ ports; 2x25G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-24PXG-2Y-E	Network Essentials	
C9200L-48PXG-4X-A	Network Advantage	Stackable 12xMultigigabit Ethernet PoE+ ports and 36x1G PoE+ ports; 4x10G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48PXG-4X-E	Network Essentials	
C9200L-48PXG-2Y-A	Network Advantage	Stackable 8xMultigigabit Ethernet PoE+ ports and 40x1G PoE+ ports; 2x25G fixed uplink ports; 2 power supply slots; 2 fixed fans; supports StackWise-80.
C9200L-48PXG-2Y-E	Network Essentials	
C9200CX-8P-2X2G-A	Network Advantage	8x1G PoE+ ports; 2x1G and 2x10G SFP+ fixed uplink ports; powered using 315W internal power supply unit; fanless.
C9200CX-8P-2X2G-E	Network Essentials	
C9200CX-12P-2X2G-A	Network Advantage	12x1G PoE+ ports; 2x1G and 2x10G SFP+ fixed uplink ports; powered using 315W internal power supply unit; fanless.
C9200CX-12P-2X2G-E	Network Essentials	

Switch Model	Default License Level <sup>1</sup>	Description
C9200CX-12T-2X2G-A	Network Advantage	12x1G Ethernet ports; 2x1G copper uplink ports, 1x1G copper uplink PD port, and 2x10G SFP+ fixed uplink ports; powered either from the copper uplink PD port or using an auxiliary 80W power adapter; fanless
C9200CX-12T-2X2G-E	Network Essentials	
C9200CX-12P-2XGH-A	Network Advantage	12x1G PoE+ ports; 2x10G SFP+ and 2x1G Copper fixed uplink ports; powered using 315W HVDC/AC internal power supply unit; fanless.
C9200CX-12P-2XGH-E	Network Essentials	
C9200CX-8P-2XGH-A	Network Advantage	8x1G PoE+ ports; 2x10G SFP+ and 2x1G Copper fixed uplink ports; powered using 315W HVDC/AC internal power supply unit; fanless.
C9200CX-8P-2XGH-E	Network Essentials	
C9200CX-8UXG-2X-A	Network Advantage	8 ports UPOE (with 4x1G and 4xmGig ports with speed up to 10G), 2x 10G SFP+ fixed uplinks, powered using 315W internal power supply unit; fanless
C9200CX-8UXG-2X-E	Network Essentials	
C9200CX-8UXG-2XH-A	Network Advantage	8 ports UPOE (with 4x1G and 4xmGig ports with speed up to 10G), 2x 10G SFP+ fixed uplinks, powered using 315W HVDC/AC internal power supply unit; fanless.
C9200CX-8UXG-2XH-E	Network Essentials	

<sup>1</sup> See Table: [Table 1: Permitted Combinations](#), on page 22, for information about the add-on licenses that you can order.

## Network Modules

The following table lists the optional uplink network modules with 1-GigabitEthernet and 10-GigabitEthernet slots. You should only operate the switch with either a network module or a blank module installed.

Network Module	Description
C9200-NM-4G <sup>1</sup>	Four 1-GigabitEthernet SFP module slots
C9200-NM-4X <sup>1</sup>	Four 10-GigabitEthernet SFP+ module slots
C9200-NM-2Y <sup>2</sup>	Two 25-GigabitEthernet SFP28 module slots
C9200-NM-2Q <sup>2</sup>	Two 40-GigabitEthernet slots with a QSFP+ connector in each slot



**Note** These network modules are supported only on the C9200 SKUs of the Cisco Catalyst 9200 Series Switches.



## Optics Modules

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





## CHAPTER 2

# What's New in Cisco IOS XE 17.14.x

- [Hardware Features in Cisco IOS XE 17.14.1, on page 7](#)
- [Software Features in Cisco IOS XE 17.14.1, on page 7](#)
- [Hardware and Software Behavior Changes in Cisco IOS XE 17.14.1, on page 8](#)

## Hardware Features in Cisco IOS XE 17.14.1

There are no new hardware features in this release.

## Software Features in Cisco IOS XE 17.14.1

Feature Name	Description
IP SLA Probe Configuration Modification Capability	Introduces support to reconfigure the parameters of a scheduled IP SLA session using the <b>configure replace</b> command.
mDNS Protocol Options	The mDNS protocol option is introduced in the <b>device sensor filter spec</b> command. This allows the user to apply the mDNS protocol TLV filter list to the device sensor output. The <b>device sensor filter list mdns</b> command is introduced to create a mDNS protocol filter containing a list of Type-Length-Value (TLV) fields that can be included or excluded in the device sensor output. The <b>tlv</b> command is introduced to configure the list of Type Length Value (TLVs) in mDNS protocol configuration mode.
OSPF Local RIB Path Limit Enhancement	The OSPF Local RIB Path Limit feature is designed to restrict the number of paths stored by OSPF in its Local RIB, offering enhanced control over network path selection. With the <b>maximum-paths</b> command enabled, the network administrators can now control the number of paths OSPF installs in the Local RIB for a specific prefix.
Precision Time Protocol	Precision Time Protocol (PTP) is defined in IEEE 1588 as Precision Clock Synchronization for Networked Measurements and Control Systems, and was developed to synchronize the clocks in packet-based networks that include distributed device clocks of varying precision and stability. This feature is implemented on the Cisco Catalyst 9200CX Compact Series Switches.

Feature Name	Description
Programmability: <ul style="list-style-type: none"> <li>• gNMI: Stream Subscriptions with on-Change Mode</li> <li>• gNMI: SubscribeResponse with sync_response</li> <li>• YANG Data Models</li> <li>• YANG Support for Mutiple Next-Hops</li> </ul>	The following programmability features are introduced in this release: <ul style="list-style-type: none"> <li>• gNMI: Stream Subscriptions with on-Change Mode: gNMI telemetry supports on-change subscriptions on the same set of models as other telemetry protocols.</li> <li>• gNMI: SubscribeResponse with sync_response: The sync_response is a boolean field that is part of the SubscribeResponse response message. The sync_response message is sent after the first update message.</li> <li>• YANG Data Models: For the list of Cisco IOS XE YANG models available with this release, navigate to: <a href="https://github.com/YangModels/yang/tree/main/vendor/cisco/xe/17141">https://github.com/YangModels/yang/tree/main/vendor/cisco/xe/17141</a>.</li> <li>• YANG Support for Mutiple Next-Hops: A new container is added under the next-hop-options choice node to retrieve all next-hops for a given route or prefix. Also, an uptime leaf node is added to provide the timestamp for each next hop.</li> </ul>
<b>show reload history</b> command	The <b>show reload history</b> command is introduced. It displays the reason for device reload and its history.
<b>spanning-tree bpdud sender-conflict</b> command	This feature allows the user to enable spanning tree protocol BPDU sender conflict feature using the <b>spanning-tree bpdud sender-conflict</b> command. When the device is in RSTP mode, BPDU packets are transmitted every two seconds from a designated port to a non-designated port. When you use the <b>spanning-tree bpdud sender-conflict</b> command, if there is any change in the RSTP mode due to sender conflict, the device generates a notification.

#### New on the WebUI

There are no new WebUI features in this release.

## Hardware and Software Behavior Changes in Cisco IOS XE 17.14.1

Behavior Change	Description
Switch Integrated Security Features (SISF) – Enhanced Throttling Limit for ARP Packets	<p>In Cisco IOS XE Amsterdam 17.3.1, a throttling limit was introduced to mitigate high CPU utilization scenarios. In a five second window, a maximum of 50 ARP broadcast packets per source IP were processed by SISF.</p> <p>In Cisco IOS XE 17.14.1, this limit is increased to a maximum of 100 ARP broadcast packets for each source IP. When the limit is reached, incoming ARP packets are dropped.</p>



## CHAPTER 3

# Important Notes

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- [Important Notes, on page 9](#)

## Important Notes

- [Unsupported Features](#)
- [Complete List of Supported Features](#)
- [Accessing Hidden Commands](#)
- [Default Behaviour](#)

### Unsupported Features

- **Cisco TrustSec**
  - Cisco TrustSec Network Device Admission Control (NDAC) on Uplinks
- **High Availability**
  - Cisco StackWise Virtual
  - Non Stop Forwarding (NSF)
  - Stacking on 9200CX SKUs
- **IP Addressing Services**
  - Gateway Load Balancing Protocol (GLBP)
  - Web Cache Communication Protocol (WCCP)
- **Layer 2**
  - Audio Video Bridging (including IEEE802.1AS, IEEE 802.1Qat, and IEEE 802.1Qav)
- **Multiprotocol Label Switching**
  - Border Gateway Protocol (BGP) on the Cisco Catalyst 9200 Series Switches and Cisco Catalyst 9200L Series Switches

- Multiprotocol Label Switching (MPLS)
- **Programmability**
  - Programmability (Cisco Plug-in for OpenFlow 1.3, Third-Party Application Hosting)
- **Security**
  - IPsec VPN
  - MACsec Encryption
    - MACsec configuration on EtherChannel
    - 256-bit AES MACsec (IEEE 802.1AE) host link encryption with MACsec Key Agreement (MKA)
    - MACsec switch-to-host connections in an overlay network.
  - Virtual Routing and Forwarding (VRF)-Aware web authentication
- **System Management**
  - Hot patching (for SMUs)
  - Performance Monitoring (PerfMon)
- **VLAN**
  - Private VLAN (PVLAN) on Trunks and Portchannels
  - Converged Access for Branch Deployments
  - Fabric Enabled Wireless on C9200L SKUs
  - Network Load Balancing (NLB)

### Complete List of Supported Features

For the complete list of features supported on a platform, see the [Cisco Feature Navigator](#).

### Accessing Hidden Commands

This section provides information about hidden commands in Cisco IOS XE and the security measures that are in place, when they are accessed. These commands are only meant to assist Cisco TAC in advanced troubleshooting and are not documented.

Hidden commands are available under:

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

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

- The commands have CLI help. Enter a question mark (?) at the system prompt to display the list of available commands.

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

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

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

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



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

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

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### Default Behaviour

Beginning from Cisco IOS XE Gibraltar 16.12.5 and later, do not fragment bit (DF bit) in the IP packet is always set to 0 for all outgoing RADIUS packets (packets that originate from the device towards the RADIUS server).







## CHAPTER 4

# Compatibility Matrix and Web UI System Requirements

- [Compatibility Matrix](#), on page 13
- [Web UI System Requirements](#), on page 20

## Compatibility Matrix

The following table provides software compatibility information between Cisco Catalyst 9200 Series Switches, Cisco Identity Services Engine, and Cisco Prime Infrastructure.

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
17.14.1	3.2 3.1 + Patch 3 3.0 + Patch 6 2.7 + Patch 7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
17.13.1	3.2 3.1 + Patch 3 3.0 + Patch 6 2.7 + Patch 7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Dublin 17.12.3	3.2 3.1 + Patch 3 3.0 + Patch 6 2.7 + Patch 7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
Dublin 17.12.2	3.2 3.1 + Patch 3 3.0 + Patch 6 2.7 + Patch 7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Dublin 17.12.1	3.2 3.1 + Patch 3 3.0 + Patch 6 2.7 + Patch 7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Dublin 17.11.1	3.2 3.1 + Patch 3 3.0 + Patch 6 2.7 + Patch 7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Dublin 17.10.1	3.2 3.1 + Patch 1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Cupertino 17.9.5	3.2 3.1 + Patch 1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Cupertino 17.9.4	3.2 3.1 + Patch 1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
Cupertino 17.9.3	3.2 3.1 + Patch 1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Cupertino 17.9.2	3.2 3.1 + Patch 1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Cupertino 17.9.1	3.2 3.1 + Patch 1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Cupertino 17.8.1	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Cupertino 17.7.1	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .

<b>Catalyst 9200</b>	<b>Cisco Identity Services Engine</b>	<b>Cisco Prime Infrastructure</b>
Bengaluru 17.6.7	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Bengaluru 17.6.6a	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Bengaluru 17.6.6	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Bengaluru 17.6.5	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Bengaluru 17.6.4	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Bengaluru 17.6.3	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
Bengaluru 17.6.2	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Bengaluru 17.6.1	3.1 3.0 latest patch 2.7 latest patch 2.6 latest patch 2.4 latest patch	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Bengaluru 17.5.1	3.0 Patch 1 2.7 Patch 2 2.6 Patch 7 2.4 Patch 13	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Bengaluru 17.4.1	3.0 2.7 Patch 2	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Amsterdam 17.3.8a	2.7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Amsterdam 17.3.8	2.7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Amsterdam 17.3.7	2.7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Amsterdam 17.3.6	2.7	C9200 and C9200L: PI 3.10 + PI 3.10 latest maintenance release + PI 3.10 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.10</a> → <b>Downloads</b> .
Amsterdam 17.3.5	2.7	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack  See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
Amsterdam 17.3.4b	2.7	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Amsterdam 17.3.4	2.7	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Amsterdam 17.3.3	2.7	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Amsterdam 17.3.2a	2.7	C9200 and C9200L: PI 3.8 + PI 3.8 latest maintenance release + PI 3.8 latest device pack See <a href="#">Cisco Prime Infrastructure 3.8</a> → <b>Downloads</b> .
Amsterdam 17.3.1	2.7	C9200 and C9200L: PI 3.8 + PI 3.8 latest maintenance release + PI 3.8 latest device pack See <a href="#">Cisco Prime Infrastructure 3.8</a> → <b>Downloads</b> .
Amsterdam 17.2.1	2.7	C9200 and C9200L: PI 3.7 + PI 3.7 latest maintenance release + PI 3.7 latest device pack See <a href="#">Cisco Prime Infrastructure 3.7</a> → <b>Downloads</b> .
Amsterdam 17.1.1	2.7	C9200 and C9200L: PI 3.6 + PI 3.6 latest maintenance release + PI 3.6 latest device pack See <a href="#">Cisco Prime Infrastructure 3.6</a> → <b>Downloads</b> .
Gibraltar 16.12.8	2.6	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → Downloads.
Gibraltar 16.12.7	2.6	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → Downloads.
Gibraltar 16.12.6	2.6	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → Downloads.
Gibraltar 16.12.5b	2.6	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → Downloads.

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
Gibraltar 16.12.5	2.6	C9200 and C9200L: PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → Downloads.
Gibraltar 16.12.4	2.6	C9200 and C9200L: PI 3.8 + PI 3.8 latest maintenance release + PI 3.8 latest device pack See <a href="#">Cisco Prime Infrastructure 3.8</a> → Downloads.
Gibraltar 16.12.3a	2.6	C9200 and C9200L: PI 3.5 + PI 3.5 latest maintenance release + PI 3.5 latest device pack See <a href="#">Cisco Prime Infrastructure 3.5</a> → <b>Downloads</b> .
Gibraltar 16.12.3	2.6	C9200 and C9200L: PI 3.5 + PI 3.5 latest maintenance release + PI 3.5 latest device pack See <a href="#">Cisco Prime Infrastructure 3.5</a> → <b>Downloads</b> .
Gibraltar 16.12.2	2.6	C9200 and C9200L: PI 3.5 + PI 3.5 latest maintenance release + PI 3.5 latest device pack See <a href="#">Cisco Prime Infrastructure 3.5</a> → <b>Downloads</b> .
Gibraltar 16.12.1	2.6	C9200 and C9200L: PI 3.5 + PI 3.5 latest maintenance release + PI 3.5 latest device pack See <a href="#">Cisco Prime Infrastructure 3.5</a> → <b>Downloads</b> .
Gibraltar 16.11.1	2.6 2.4 Patch 5	C9200 and C9200L: PI 3.4 + PI 3.4 latest maintenance release + PI 3.4 latest device pack See <a href="#">Cisco Prime Infrastructure 3.4</a> → <b>Downloads</b> .
Gibraltar 16.10.1	2.4	C9200: PI 3.4 + Device Pack 9 C9200L: PI 3.4 + Device Pack 7 See <a href="#">Cisco Prime Infrastructure 3.4</a> → <b>Downloads</b> .
Fuji 16.9.8	2.5 2.1	PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Fuji 16.9.7	2.5 2.1	PI 3.9 + PI 3.9 latest maintenance release + PI 3.9 latest device pack See <a href="#">Cisco Prime Infrastructure 3.9</a> → <b>Downloads</b> .
Fuji 16.9.6	2.4	PI 3.4 + Device Pack 7 See <a href="#">Cisco Prime Infrastructure 3.4</a> → <b>Downloads</b> .

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
Fuji 16.9.5	2.4	PI 3.4 + Device Pack 7 See <a href="#">Cisco Prime Infrastructure 3.4</a> → Downloads.
Fuji 16.9.4	2.4	PI 3.4 + Device Pack 7 See <a href="#">Cisco Prime Infrastructure 3.4</a> → Downloads.
Fuji 16.9.3	2.4	PI 3.4 + Device Pack 7 See <a href="#">Cisco Prime Infrastructure 3.4</a> → Downloads.
Fuji 16.9.2 <sup>2</sup>	2.4	PI 3.4 + Device Pack 7 See <a href="#">Cisco Prime Infrastructure 3.4</a> → Downloads.

<sup>2</sup> The compatibility information for Fuji 16.9.2 applies only to the C9200L SKUs.

## Web UI System Requirements

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

### Minimum Hardware Requirements

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
233 MHz minimum <sup>3</sup>	512 MB <sup>4</sup>	256	1280 x 800 or higher	Small

<sup>3</sup> We recommend 1 GHz

<sup>4</sup> We recommend 1 GB DRAM

### Software Requirements

#### Operating Systems

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

#### Browsers

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





## CHAPTER 5

# Licensing and Scaling Guidelines

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- [Licensing, on page 21](#)
- [Scaling Guidelines, on page 23](#)

## Licensing

This section provides information about the licensing packages for features available on Cisco Catalyst 9000 Series Switches.

## License Levels

The software features available on Cisco Catalyst 9200 Series Switches fall under these base or add-on license levels.

### Base Licenses

- Network Essentials
- Network Advantage—Includes features available with the Network Essentials license and more.

### Add-On Licenses

Add-On Licenses require a Network Essentials or Network Advantage as a pre-requisite. The features available with add-on license levels provide Cisco innovations on the switch, as well as on the Cisco Digital Network Architecture Center (Cisco DNA Center).

- DNA Essentials
- DNA Advantage— Includes features available with the DNA Essentials license and more.

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

## Available Licensing Models and Configuration Information

- Cisco IOS XE Fuji 16.9.2 to Cisco IOS XE Amsterdam 17.3.1: Smart Licensing is the default and the only supported method to manage licenses.

In the [software configuration guide](#) of the required release, see **System Management** → **Configuring Smart Licensing**.

- Cisco IOS XE Amsterdam 17.3.2a and later: Smart Licensing Using Policy, which is an enhanced version of Smart Licensing, is the default and the only supported method to manage licenses.

In the [software configuration guide](#) of the required release (17.3.x onwards), see **System Management** → **Smart Licensing Using Policy**.

For a more detailed overview on Cisco Licensing, go to [cisco.com/go/licensingguide](https://cisco.com/go/licensingguide).

## License Levels - Usage Guidelines

- The duration or term for which a purchased license is valid:

Smart Licensing Using Policy	Smart Licensing
<ul style="list-style-type: none"> <li>• Perpetual: There is no expiration date for such a license.</li> <li>• Subscription: The license is valid only until a certain date (for a three, five, or seven year period).</li> </ul>	<ul style="list-style-type: none"> <li>• Permanent: for a license level, and without an expiration date.</li> <li>• Term: for a license level, and for a three, five, or seven year period.</li> <li>• Evaluation: a license that is not registered.</li> </ul>

- Base licenses (Network Essentials and Network-Advantage) are ordered and fulfilled only with a perpetual or permanent license type.
- Add-on licenses (DNA Essentials and DNA Advantage) are ordered and fulfilled only with a subscription or term license type.
- An add-on license level is included when you choose a network license level. If you use DNA features, renew the license before term expiry, to continue using it, or deactivate the add-on license and then reload the switch to continue operating with the base license capabilities.
- When ordering an add-on license with a base license, note the combinations that are permitted and those that are not permitted:

**Table 1: Permitted Combinations**

	DNA Essentials	DNA Advantage
Network Essentials	Yes	No
Network Advantage	Yes <sup>5</sup>	Yes

<sup>5</sup> You will be able to purchase this combination only at the time of the DNA license renewal and not when you purchase DNA-Essentials the first time.

- Evaluation licenses cannot be ordered. They are not tracked via Cisco Smart Software Manager and expire after a 90-day period. Evaluation licenses can be used only once on the switch and cannot be regenerated. Warning system messages about an evaluation license expiry are generated only 275 days after expiration and every week thereafter. An expired evaluation license cannot be reactivated after reload. This applies only to *Smart Licensing*. The notion of evaluation licenses does not apply to *Smart Licensing Using Policy*.

## Scaling Guidelines

For information about feature scaling guidelines, see the Cisco Catalyst 9200 Series Switches datasheet at:  
<https://www.cisco.com/c/en/us/products/collateral/switches/catalyst-9200-series-switches/nb-06-cat9200-ser-data-sheet-cte-en.html>





## CHAPTER 6

# Limitations and Restrictions

- [Limitations and Restrictions, on page 25](#)

## Limitations and Restrictions

- Control Plane Policing (CoPP)—The **show run** command does not display information about classes configured under `system-cpp policy`, when they are left at default values. Use the **show policy-map system-cpp-policy** or the **show policy-map control-plane** commands in privileged EXEC mode instead.
- Hardware limitations
  - Management Port—You cannot modify the configured port speed, duplex mode and flow control and disable auto-negotiation on the Ethernet Management port (GigabitEthernet0/0). Port speed and duplex mode can only be changed from a peer port.
  - Network Module — When the C9200-NM-4X network module is plugged into the C9200 SKUs of the Cisco Catalyst 9200 Series Switches, the uplink interface remains in down state until the network module is recognized by the switch. The time taken for the switch to recognize the network module is longer in comparison to the time taken by the switch to recognize other interconnected devices.
  - If the 1-meter and 1.5-meter 10-GBase-CX1 cables, which are connected on the 10-G ports of the Catalyst 9200L switches, are connected to the 10-G peer ports of the Catalyst 9200L or Catalyst 9200 switches, the peer device might go into the error-disabled state because of link flapping if the local device is restarted. As a workaround, run the **shut** and **no shut** commands on the error-disabled peer interfaces.
- QoS restrictions
  - When configuring QoS queuing policy, the sum of the queuing buffer should not exceed 100%.
  - Policing and marking policy on sub interfaces is supported.
  - Marking policy on switched virtual interfaces (SVI) is supported.
  - QoS policies are not supported for port-channel interfaces, tunnel interfaces, and other logical interfaces.
- Secure Shell (SSH)
  - Use SSH Version 2. SSH Version 1 is not supported.

- When the device is running SCP and SSH cryptographic operations, expect high CPU until the SCP read process is completed. SCP supports file transfers between hosts on a network and uses SSH for the transfer.

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

- Smart Licensing Using Policy: Starting with Cisco IOS XE Amsterdam 17.3.2a, with the introduction of Smart Licensing Using Policy, even if you configure a hostname for a product instance or device, only the Unique Device Identifier (UDI) is displayed. This change in the display can be observed in all licensing utilities and user interfaces where the hostname was displayed in earlier releases. It does not affect any licensing functionality. There is no workaround for this limitation.

The licensing utilities and user interfaces that are affected by this limitation include only the following: Cisco Smart Software Manager (CSSM), Cisco Smart License Utility (CSLU), and Smart Software Manager On-Prem (SSM On-Prem).

This limitation is removed from Cisco IOS XE Cupertino 17.9.1. If you configure a hostname and disable hostname privacy (**no license smart privacy hostname** global configuration command), hostname information is sent from the product instance and displayed on the applicable user interfaces (CSSM, CSLU, SSM On-Prem). For more information, see the command reference for this release.

- Stacking
  - Stacking is supported on Cisco Catalyst 9200 Series Switches. A switch stack supports up to eight stack members. However, you cannot stack C9200 SKUs with C9200L SKUs
  - The supported stacking bandwidth on C9200L SKUs is up to 80Gbps; on C9200 SKUs, this is up to 160Gbps.
  - The C9200-24PB and C9200-48PB switch models can be stacked only with each other and not with other models of the Cisco Catalyst 9200 Series Switches.
  - Auto upgrade for a new member switch is supported only in the install mode.
- 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 Gibraltar 16.12.2 or a later release, using the legacy command can cause authentication failures. Use the **tacacs server** command in global configuration mode.
- USB Authentication—When you connect a Cisco USB drive to the switch, the switch tries to authenticate the drive against an existing encrypted preshared key. Since the USB drive does not send a key for authentication, the following message is displayed on the console when you enter **password encryption aes** command:
 

```
Device(config)# password encryption aes
Master key change notification called without new or old key
```
- Catalyst 9000 Series Switches support MACsec switch-to-switch connections. We do not recommend configuring MACsec switch-to-host connections in an overlay network. For assistance with an existing switch-to-host MACsec implementation or a design review, contact your Cisco Sales Representative or Channel Partner.
- VLAN Restriction—It is advisable to have well-defined segregation while defining data and voice domain during switch configuration and to maintain a data VLAN different from voice VLAN across the switch

stack. If the same VLAN is configured for data and voice domains on an interface, the resulting high CPU utilization might affect the device.

- YANG data modeling limitation—A maximum of 20 simultaneous NETCONF sessions are supported.
- Embedded Event Manager—Identity event detector is not supported on Embedded Event Manager.
- Upgrading the software image from Cisco IOS XE Gibraltar 16.12.x to any of the later releases can result in a persistent database operation failure and after which the persistent database cannot be restored.

To avoid the persistent database operation failure, use the **dir bootflash:.dbpersist** command to list all DB persist files and then use **delete bootflash:.dbpersist/folder\_name/file\_name** and **bootflash:.dbpersist/folder\_name/file\_name.meta** commands to delete individual database and meta files from each persistent database folder.

- The File System Check (fsck) utility is not supported in install mode.
- The DiagMemoryTest GOLD test is not supported on the Catalyst 9200 Series Switches.
- On Cisco Catalyst 9200CX Series Switches, zero touch provisioning and guest shell are supported but connecting to an external network from a guest shell does not work, as Management, AppGigabitEthernet, and VirtualPortGroup interfaces are not supported.
- The command **service-routing mdns-sd** is being deprecated. Use the **mdns-sd gateway** command instead.







# CHAPTER 7

## Boot Loader Versions

- [Boot Loader Versions, on page 29](#)

### Boot Loader Versions

The following table provides boot loader version information for the Cisco Catalyst 9200 Series Switches.

Release	ROMMON Version
17.14.1	17.12.1r [FC3]
17.13.1	17.12.1r [FC3]
Dublin 17.12.3	17.12.1r [FC3]
Dublin 17.12.2	17.12.1r [FC3]
Dublin 17.12.1	17.12.1r [FC2]
Dublin 17.11.1	17.9.1r [FC11]
Dublin 17.10.1	17.9.1r [FC8]
Cupertino 17.9.5	17.9.1r [FC13]
Cupertino 17.9.4	17.9.1r [FC13]
Cupertino 17.9.3	17.9.1r [FC11]
Cupertino 17.9.2	17.9.1r [FC8]
Cupertino 17.9.1	17.9.1r [FC8]
Cupertino 17.8.1	17.8.1r [FC5]
Cupertino 17.7.1	17.6.1r [FC1]
Bengaluru 17.6.7	17.9.1r [FC8]
Bengaluru 17.6.6a	17.9.1r [FC8]

Release	ROMMON Version
Bengaluru 17.6.6	17.9.1r [FC8]
Bengaluru 17.6.5	17.9.1r [FC8]
Bengaluru 17.6.4	17.9.1r [FC8]
Bengaluru 17.6.3	17.8.1r [FC5]
Bengaluru 17.6.2	17.6.1r [FC1]
Bengaluru 17.6.1	17.6.1r [FC1]
Bengaluru 17.5.1	17.5.1r [FC4]
Bengaluru 17.4.1	17.4.1r [FC3]
Amsterdam 17.3.8a	17.9.1r [FC8]
Amsterdam 17.3.8	17.9.1r [FC8]
Amsterdam 17.3.7	17.9.1r [FC8]
Amsterdam 17.3.6	17.9.1r [FC8]
Amsterdam 17.3.5	17.5.1r [FC4]
Amsterdam 17.3.4	17.5.1r [FC4]
Amsterdam 17.3.3	17.5.1r [FC4]
Amsterdam 17.3.2a	17.3.1r [FC4]
Amsterdam 17.3.1	17.3.1r [FC3]
Amsterdam 17.2.1	17.2.1r [FC2]
Amsterdam 17.1.1	17.1.1 [FC3]



## CHAPTER 8

# Upgrading the Switch Software

- [Finding the Software Version, on page 31](#)
- [Software Images, on page 31](#)
- [Automatic Boot Loader Upgrade, on page 31](#)
- [Software Installation Commands, on page 32](#)
- [Upgrading in Install Mode, on page 32](#)
- [Downgrading in Install Mode, on page 37](#)

## Finding the Software Version

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

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



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

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

## Software Images

Release	Image Type	File Name
Cisco IOS XE 17.14.1	CAT9K_LITE_IOSXE	cat9k_lite_iosxe.17.14.01.S

## Automatic Boot Loader Upgrade

When you upgrade from the existing release on your switch to a later or newer release for the first time, the boot loader may be automatically upgraded, based on the hardware version of the switch. If the boot loader

is automatically upgraded, it will take effect on the next reload. If you go back to the older release after this, the boot loader is not downgraded. The updated boot loader supports all previous releases.

To know the bootloader version that applies to every major and maintenance release, see [Boot Loader Versions, on page 29](#).



**Caution** Do not power cycle your switch during the upgrade.

## Software Installation Commands

Summary of Software Installation Commands	
To install and activate the specified file, and to commit changes to be persistent across reloads: <b>install add file</b> <i>filename</i> [ <b>activate commit</b> ]	
To separately install, activate, commit, cancel, or remove the installation file: <b>install ?</b>	
<b>add file tftp:</b> <i>filename</i>	Copies the install file package from a remote location to the device and performs a compatibility check for the platform and image versions.
<b>activate</b> [ <b>auto-abort-timer</b> ]	Activates the file, and reloads the device. The <b>auto-abort-timer</b> keyword automatically rolls back image activation.
<b>commit</b>	Makes changes persistent over reloads.
<b>rollback to committed</b>	Rolls back the update to the last committed version.
<b>abort</b>	Cancels file activation, and rolls back to the version that was running before the current installation procedure started.
<b>remove</b>	Deletes all unused and inactive software installation files.

## Upgrading in Install Mode

Follow these instructions to upgrade from one release to another, in install mode. To perform a software image upgrade, you must be booted into IOS through **boot flash:packages.conf**.

### Before you begin

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

When upgrading from ...	To...
Cisco IOS XE 17.13.x or earlier releases	Cisco IOS XE 17.14.x

The sample output in this section displays upgrade from Cisco IOS XE 17.13.1 to Cisco IOS XE 17.14.1 using **install** commands only.

## Procedure

### Step 1

#### Clean-up

##### **install remove inactive**

Use this command to clean-up old installation files in case of insufficient space and to ensure that you have at least 1GB of space in flash, to expand a new image.

The following sample output displays the cleaning up of unused files, by using the **install remove inactive** command:

```
Switch# install remove inactive

install_remove: START Mon Mar 25 17:46:18 IST 2024
Cleaning up unnecessary package files
No path specified, will use booted path flash:packages.conf
Cleaning flash:
  Scanning boot directory for packages ... done.
  Preparing packages list to delete ...
    cat9k_lite-rpbase.17.13.01.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-rpboot.17.13.01.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-srdriver.17.13.01.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-webui.17.13.01.SPA.pkg
      File is in use, will not delete.
    packages.conf
      File is in use, will not delete.
done.

The following files will be deleted:
[switch 1]:
/flash/cat9k_lite_iosxe.17.13.01.SPA.bin

Do you want to remove the above files? [y/n]y

[switch 1]:
Deleting file flash:cat9k_lite_iosxe.17.13.01.SPA.bin ... done.
SUCCESS: Files deleted.
--- Starting Post_Remove_Cleanup ---
Performing Post_Remove_Cleanup on all members
  [1] Post_Remove_Cleanup package(s) on switch 1
  [1] Finished Post_Remove_Cleanup on switch 1
Checking status of Post_Remove_Cleanup on [1]
Post_Remove_Cleanup: Passed on [1]
Finished Post_Remove_Cleanup
SUCCESS: install_remove Mon Mar 25 17:47:20 IST 2024
Switch#
```

### Step 2

#### Copy new image to flash

##### a) **copy tftp:[//location]/directory]/filenameflash:**

Use this command to copy the new image from a TFTP server to flash memory. The location is either an IP address or a host name. The filename is specified relative to the directory used for file transfers. Skip this step if you want to use the new image from a TFTP server.

```
Switch# copy tftp://10.8.0.6/image/cat9k_lite_iosxe.17.13.01.SPA.bin flash:
```

```

Destination filename [cat9k_lite_iosxe.17.13.01.SPA.bin]?
Accessing tftp://10.8.0.6/cat9k_lite_iosxe.17.13.01.SPA.bin...
Loading /cat9k_lite_iosxe.17.13.01.SPA.bin from 10.8.0.6 (via GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 601216545 bytes]

601216545 bytes copied in 50.649 secs (11870255 bytes/sec)

```

b) **dir flash:**

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

```

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

Directory of flash:/

434184 -rw- 601216545 Mar 25 2024 10:18:11 -07:00 cat9k_lite_iosxe.17.13.01.SPA.bin
11353194496 bytes total (8976625664 bytes free)

```

**Step 3** Set boot variable

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

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

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

b) **no boot manual**

Use this command to configure the switch to auto-boot.

```
Switch(config)# no boot manual
Switch(config)# exit
```

c) **write memory**

Use this command to save boot settings.

```
Switch# write memory
```

d) **show boot**

Use this command to verify the boot variable (packages.conf) and manual boot setting (no):

```

Switch# show boot
-----
Switch 3
-----
Current Boot Variables:
BOOT variable = flash:packages.conf;

Boot Variables on next reload:
BOOT variable = flash:packages.conf;
Manual Boot = no
Enable Break = yes
Boot Mode = DEVICE
iPXE Timeout = 0

```

**Step 4** Install image to flash

**install add file activate commit**

Use this command to install the image.

We recommend that you point to the source image on your TFTP server or the flash drive of the switch, if you have copied the image to flash memory.

The following sample output displays installation of the Cisco IOS XE 17.14.1 software image in the flash memory:

```
Switch# install add file flash:cat9k_lite_iosxe.17.14.01.SPA.bin activate commit
install_add_activate_commit: START Mon Mar 25 12:51:55 IST 2024
Mar 25 12:51:57.795: %INSTALL-5-INSTALL_START_INFO: R0/0: install_engine: Started install
one-shot flash:cat9k_lite_iosxe.17.14.01.SPA.bin
install_add_activate_commit: Adding PACKAGE
install_add_activate_commit: Checking whether new add is allowed ....

--- Starting initial file syncing ---
Info: Finished copying flash:cat9k_lite_iosxe.17.14.01.SPA.bin to the selected switch(es)
Finished initial file syncing

--- Starting Add ---
Performing Add on all members
  [1] Add package(s) on switch 1
  [1] Finished Add on switch 1
Checking status of Add on [1]
Add: Passed on [1]
Finished Add

Image added. Version: 17.14.01.0.276
install_add_activate_commit: Activating PACKAGE

gzip: initramfs.cpio.gz: decompression OK, trailing garbage ignored
Following packages shall be activated:
/flash/cat9k_lite-webui.17.14.01.SPA.pkg
/flash/cat9k_lite-srdriver.17.14.01.SPA.pkg
/flash/cat9k_lite-rpboot.17.14.01.SPA.pkg
/flash/cat9k_lite-rpbase.17.14.01.SPA.pkg

This operation may require a reload of the system. Do you want to proceed? [y/n]y

--- Starting Activate ---
Performing Activate on all members
Mar 25 13:03:24.337: %INSTALL-5-INSTALL_AUTO_ABORT_TIMER_PROGRESS: R0/0: rollback_timer:
Install auto abort timer will expire in 7200 seconds
  [1] Activate package(s) on switch 1
    --- Starting list of software package changes ---
    Old files list:
      Removed cat9k_lite-rpbase.17.13.01.SPA.pkg
      Removed cat9k_lite-rpboot.17.13.01.SPA.pkg
      Removed cat9k_lite-srdriver.17.13.01.SPA.pkg
      Removed cat9k_lite-webui.17.13.01.SPA.pkg
    New files list:
      Added cat9k_lite-rpbase.17.14.01.SPA.pkg
      Added cat9k_lite-rpboot.17.14.01.SPA.pkg
      Added cat9k_lite-srdriver.17.14.01.SPA.pkg
      Added cat9k_lite-webui.17.14.01.SPA.pkg
    Finished list of software package changes
  [1] Finished Activate on switch 1
Checking status of Activate on [1]
Activate: Passed on [1]
Finished Activate

*Mar 25 13:03:24.298 IST: %INSTALL-5-INSTALL_AUTO_ABORT_TIMER_PROGRESS: Switch 1 R0/0:
rollback_timer: Install auto abort timer will expire in 7200 seconds--- Starting Commit ---
Performing Commit on all members
  [1] Commit package(s) on switch 1
  [1] Finished Commit on switch 1
```

```

Checking status of Commit on [1]
Commit: Passed on [1]
Finished Commit

Install will reload the system now!
SUCCESS: install_add_activate_commit Mon Mar 25 13:04:23 IST 2024
Mar 25 13:04:24.586: %INSTALL-5-INSTALL_COMPLETED_INFO: R0/0: install_engine: Completed
install one-shot PACKAGE flash:cat9k_lite_iosxe.17.13.01.SPA.bin

```

**Note** The system reloads automatically after executing the **install add file activate commit** command. You do not have to manually reload the system.

## Step 5 Verify installation

After the software has been successfully installed, use this command to verify that the flash partition has four new `.pkg` files and two `.conf` files.

### a) `dir flash:*.pkg`

The following is sample output of the `dir flash:*.pkg` command:

```

Switch# dir flash:*.pkg

Directory of flash:/*.pkg
Directory of flash:/
48582 -rw- 298787860 Nov 20 2023 05:13:32 +00:00 cat9k_lite-rpbase.17.13.01.SPA.pkg
48585 -rw- 35713901 Nov 20 2023 05:14:12 +00:00 cat9k_lite-rpboot.17.13.01.SPA.pkg
48583 -rw- 4252692 Nov 20 2023 05:13:33 +00:00 cat9k_lite-srdriver.17.13.01.SPA.pkg
48584 -rw- 8119312 Nov 20 2023 05:13:34 +00:00 cat9k_lite-webui.17.13.01.SPA.pkg

16640 -rw- 301188116 Mar 25 2024 05:33:25 +00:00 cat9k_lite-rpbase.17.14.01.SPA.pkg
16647 -rw- 35112025 Mar 25 2024 05:34:06 +00:00 cat9k_lite-rpboot.17.14.01.SPA.pkg
16642 -rw- 4326420 Mar 25 2024 05:33:25 +00:00 cat9k_lite-srdriver.17.14.01.SPA.pkg
16643 -rw- 8328208 Mar 25 2024 05:33:25 +00:00 cat9k_lite-webui.17.14.01.SPA.pkg

```

### b) `dir flash:*.conf`

The following is sample output of the `dir flash:*.conf` command. It displays the `.conf` files in the flash partition; note the two `.conf` files:

- `packages.conf`—the file that has been re-written with the newly installed `.pkg` files
- `cat9k_lite_iosxe.17.14.01.SPA.conf`— a backup copy of the newly installed `packages.conf` file

```

Switch# dir flash:*.conf

Directory of flash:/*.conf
Directory of flash:/

16631 -rw- 4882 Mar 25 2024 05:39:42 +00:00 packages.conf
16634 -rw- 4882 Mar 25 2024 05:34:06 +00:00 cat9k_lite_iosxe.17.14.01.SPA.conf

```

## Step 6 Reload and verify version

### a) `reload`

Use this command to reload the switch. When you boot the new image, the boot loader is automatically updated, but the new bootloader version is not displayed in the output until the next reload.

```
Switch# reload
```

### b) `show version`



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

The following sample output of the **show version** command displays the Cisco IOS XE 17.14.1 image on the device:

```
Switch# show version

Cisco IOS XE Software, Version 17.14.01
Cisco IOS Software, Catalyst L3 Switch Software (CAT9K_LITE_IOSXE), Version 17.14.1,
RELEASE SOFTWARE (fcl)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2024 by Cisco Systems, Inc.
Compiled Mon 25-Mar-23 19:57 by mcpre
<output truncated>
```

## Downgrading in Install Mode

Follow these instructions to downgrade from one release to another, in install mode. To perform a software image downgrade, you must be booted into IOS through **boot flash:packages.conf**.

### Before you begin

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

When downgrading from ...	To ...
Cisco IOS XE 17.14.x	Cisco IOS XE 17.13.x or earlier releases.



**Note** New switch models that are introduced in a release cannot be downgraded. The release in which a switch model is introduced is the minimum software version for that model.

The sample output in this section shows downgrade from Cisco IOS XE 17.14.1 to Cisco IOS XE 17.13.1, using **install** commands.

### Procedure

#### Step 1

Clean-up

#### **install remove inactive**

Use this command to clean-up old installation files in case of insufficient space and to ensure that you have at least 1GB of space in flash, to expand a new image.

The following sample output displays the cleaning up of unused files, by using the **install remove inactive** command:

```
Switch# install remove inactive
install_remove: START Mon Nov 20 17:46:18 IST 2023
Cleaning up unnecessary package files
No path specified, will use booted path flash:packages.conf
Cleaning flash:
```

```

Scanning boot directory for packages ... done.
Preparing packages list to delete ...
  cat9k_lite-rpbase.17.14.01.SPA.pkg
    File is in use, will not delete.
  cat9k_lite-rpboot.17.14.1.SPA.pkg
    File is in use, will not delete.
  cat9k_lite-srdriver.17.14.1.SPA.pkg
    File is in use, will not delete.
  cat9k_lite-webui.17.14.1.SPA.pkg
    File is in use, will not delete.
  packages.conf
    File is in use, will not delete.
done.

The following files will be deleted:
[switch 1]:
/flash/cat9k_lite_iosxe.17.14.1.SPA.bin

Do you want to remove the above files? [y/n]y
[switch 1]:
Deleting file flash:cat9k_lite_iosxe.17.14.1.SPA.bin ... done.
SUCCESS: Files deleted.
--- Starting Post_Remove_Cleanup ---
Performing Post_Remove_Cleanup on all members
  [1] Post_Remove_Cleanup package(s) on switch 1
  [1] Finished Post_Remove_Cleanup on switch 1
Checking status of Post_Remove_Cleanup on [1]
Post_Remove_Cleanup: Passed on [1]
Finished Post_Remove_Cleanup

SUCCESS: install_remove  Mon Nov 20 17:47:20 IST 2023
Switch#

```

## Step 2 Copy new image to flash

### a) **copy tftp:[[/location]/directory]/filenameflash:**

Use this command to copy the new image from a TFTP server to flash memory. The location is either an IP address or a host name. The filename is specified relative to the directory used for file transfers. Skip this step if you want to use the new image from a TFTP server.

```

Switch# copy tftp://10.8.0.6/image/cat9k_lite_iosxe.17.13.1.SPA.bin flash:

Destination filename [cat9k_lite_iosxe.17.13.1.SPA.bin]?
Accessing tftp://10.8.0.6/cat9k_lite_iosxe.17.13.1.SPA.bin...
Loading /cat9k_lite_iosxe.17.13.1.SPA.bin from 10.8.0.6 (via GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 508584771 bytes]
508584771 bytes copied in 101.005 secs (5035244 bytes/sec)

```

### b) **dir flash:**

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

```

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

Directory of flash:/

434184 -rw- 508584771 Mon Nov 20 2023 13:35:16 -07:00 cat9k_lite_iosxe.17.13.1.SPA.bin
11353194496 bytes total (9055866880 bytes free)

```

**Step 3** Set boot variablea) **boot system flash:packages.conf**

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

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

b) **no boot manual**

Use this command to configure the switch to auto-boot.

```
Switch(config)# no boot manual
Switch(config)# exit
```

c) **write memory**

Use this command to save boot settings.

```
Switch# write memory
```

d) **show boot**

Use this command to verify the boot variable (packages.conf) and manual boot setting (no):

```
Switch# show boot
-----
Switch 3
-----
Current Boot Variables:
BOOT variable = flash:packages.conf;

Boot Variables on next reload:
BOOT variable = flash:packages.conf;
Manual Boot = no
Enable Break = yes
Boot Mode = DEVICE
iPXE Timeout = 0
```

**Step 4** Downgrade software image**install add file activate commit**

Use this command to install the image.

We recommend that you point to the source image on your TFTP server or the flash drive of the switch, if you have copied the image to flash memory.

The following example displays the installation of the Cisco IOS XE 17.13.1 software image to flash, by using the **install add file activate commit** command.

```
Switch# install add file flash:cat9k_lite_iosxe.17.13.01.SPA.bin activate commit activate
commit

install_add_activate_commit: START Mon Nov 20 13:17:28 IST 2023
install_add_activate_commit: Adding PACKAGE
install_add_activate_commit: Checking whether new add is allowed ....

--- Starting initial file syncing ---
Info: Finished copying flash:cat9k_lite_iosxe.17.13.01.SPA.bin to the selected switch(es)
Finished initial file syncing

--- Starting Add ---
Performing Add on all members
  [1] Add package(s) on switch 1
  [1] Finished Add on switch 1
```

```

Checking status of Add on [1]
Add: Passed on [1]
Finished Add

Image added. Version: 17.13.01.0.203
install_add_activate_commit: Activating PACKAGE

gzip: initramfs.cpio.gz: decompression OK, trailing garbage ignored
Following packages shall be activated:
/flash/cat9k_lite-webui.17.13.01.SPA.pkg
/flash/cat9k_lite-srdriver.17.13.01.SPA.pkg
/flash/cat9k_lite-rpboot.17.13.01.SPA.pkg
/flash/cat9k_lite-rpbase.17.13.01.SPA.pkg

This operation may require a reload of the system. Do you want to proceed? [y/n]
--- Starting Activate ---
Performing Activate on all members
Nov 20 13:29:31.133: %INSTALL-5-INSTALL_AUTO_ABORT_TIMER_PROGRESS: R0/0: rollback_timer:
Install auto abort timer will expire in 7200 seconds

*Nov 20 13:29:31.093 IST: %INSTALL-5-INSTALL_AUTO_ABORT_TIMER_PROGRESS: Switch 1 R0/0:
rollback_timer: Install auto abort timer will expire in 7200 seconds [1] Activate package(s)
on switch 1
--- Starting list of software package changes ---
Old files list:
  Removed cat9k_lite-rpbase.17.14.01.SPA.pkg
  Removed cat9k_lite-rpboot.17.14.01.SPA.pkg
  Removed cat9k_lite-srdriver.17.14.01.SPA.pkg
  Removed cat9k_lite-webui.17.14.01.SPA.pkg
New files list:
  Added cat9k_lite-rpbase.17.13.01.SPA.pkg
  Added cat9k_lite-rpboot.17.13.01.SPA.pkg
  Added cat9k_lite-srdriver.17.13.01.SPA.pkg
  Added cat9k_lite-webui.17.13.01.SPA.pkg
Finished list of software package changes
[1] Finished Activate on switch 1
Checking status of Activate on [1]
Activate: Passed on [1]
Finished Activate

--- Starting Commit ---
Performing Commit on all members
  [1] Commit package(s) on switch 1
  [1] Finished Commit on switch 1
Checking status of Commit on [1]
Commit: Passed on [1]
Finished Commit

Send model notification for install_add_activate_commit before reload
Install will reload the system now!
SUCCESS: install_add_activate_commit Mon Nov 20 13:30:52 IST 2023
Nov 20 13:30:53.573: %INSTALL-5-INSTALL_COMPLETED_INFO: R0/0: install_engine: Completed
install one-shot PACKAGE flash:cat9k_lite_iosxe.17.13.01.SPA.bin
Nov 20 13:30:53.573 %INSTALL-5-INSTALL_COMPLETED_INFO: R0/0: install_engine: Completed
install one-shot PACKAGE flash:cat9k_lite_iosxe.17.13.01.SPA.bin

switch3#
Chassis 1 reloading, reason - Reload command

*Nov 20 13:30:53.529 IST: %INSTALL-5-INSTALL_COMPLETED_INFO: Switch 1 R0/0: install_engine:
Completed install one-shot PACKAGE flash:cat9k_lite_iosxe.17.13.01.SPA.bin
*Nov 20 13:30:54.526 IST: %STACKMGR-1-RELOAD: Switch 1 R0/0: stack_mgr: Reloading due to
reason Reload command Nov 20 13:30:58.121: %PMAN-5-EXITACTION: F0/0: pvp: Process manager
is exiting: reload fp actionrequested

```

```
Nov 20 13:31:01.303: %PMAN-5-EXITACTION: R0/0: pvp: Process manager is exiting: rp processes  
exit with reload switch code
```

**Note** The system reloads automatically after executing the **install add file activate commit** command. You do not have to manually reload the system.

**Step 5** Verify version  
**show version**

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

**Note** When you downgrade the software image, the bootloader version does not downgrade. It remains updated.

The following sample output of the **show version** command displays the Cisco IOS XE 17.13.1 image on the device:

```
Switch# show version  
Cisco IOS XE Software, Version 17.13.01  
Cisco IOS Software [Dublin], Catalyst L3 Switch Software (CAT9K_LITE_IOSXE), Version 17.13.1,  
RELEASE SOFTWARE (fc2)  
Technical Support: http://www.cisco.com/techsupport  
Copyright (c) 1986-2023 by Cisco Systems, Inc.  
<output truncated>
```

---





## CHAPTER 9

### Caveats

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- [Cisco Bug Search Tool](#), on page 43
- [Open Caveats in Cisco IOS XE 17.14.x](#), on page 43
- [Resolved Caveats in Cisco IOS XE 17.14.1](#), on page 43

### 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 17.14.x

There are no open caveats in this release.

### Resolved Caveats in Cisco IOS XE 17.14.1

Identifier	Headline
<a href="#">CSCwi30269</a>	Port 2228 isn't closed after reload when l2-traceroute is disabled, Security threat
<a href="#">CSCwi62480</a>	'show inventory ' shows 'Unknown uplink module' for FRU uplink module when reload Cat9200
<a href="#">CSCwi72959</a>	When removed one FAN other FAN LED goes amber
<a href="#">CSCwh29961</a>	show stacks: Information of Last System Crash:%Error opening crashinfo:crashinfo_RP_00_00
<a href="#">CSCwh38627</a>	C9200L:Stack switch mgmt port reply unknnon mac address







# CHAPTER 10

## Additional Information

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- [Troubleshooting](#), on page 45
- [Related Documentation](#), on page 45
- [Communications, Services, and Additional Information](#), on page 45

## Troubleshooting

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

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

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

## Related Documentation

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

All support documentation for Cisco Catalyst 9200 Series Switches is at this URL: <https://www.cisco.com/c/en/us/support/switches/catalyst-9200-r-series-switches/tsd-products-support-series-home.html>

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

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

## Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
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- To obtain general networking, training, and certification titles, visit [Cisco Press](#).
- To find warranty information for a specific product or product family, access [Cisco Warranty Finder](#).

### **Cisco Bug Search Tool**

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

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