



## **Release Notes for Cisco Catalyst 9200 Series Switches, Cisco IOS XE Cupertino 17.9.x**

**First Published:** 2022-08-01

**Last Modified:** 2023-03-10

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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	

<sup>1</sup> See Table: [Table 1: Permitted Combinations](#), on page 18, 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

# Whats New in Cisco IOS XE Cupertino 17.9.x

- [Whats New in Cisco IOS XE Cupertino 17.9.3, on page 5](#)
- [Whats New in Cisco IOS XE Cupertino 17.9.2, on page 6](#)
- [Whats New in Cisco IOS XE Cupertino 17.9.1, on page 6](#)

## Whats New in Cisco IOS XE Cupertino 17.9.3

### Hardware Features in Cisco IOS XE Cupertino 17.9.3

There are no new hardware features in this release.

### Software Features in Cisco IOS XE Cupertino 17.9.3

Feature Name	Description
LISP VXLAN Fabric for a Wired Network	A LISP VXLAN fabric is an enterprise solution that enables policy-based segmentation over a LISP-based fabric overlay across a Campus and Branch network. It uses a LISP-based control plane and VXLAN-based data plane.

### Hardware and Software Behavior Changes in Cisco IOS XE Cupertino 17.9.3

Behavior Change	Description
Inlet Temperature Threshold Values	Yellow and Red thresholds for inlet temperature are modified on Cisco Catalyst 9200CX Series Switches. The new values are: <ul style="list-style-type: none"><li>• Yellow Threshold: 74 degree celsius</li><li>• Red Threshold: 81 degree celsius</li></ul>

## Whats New in Cisco IOS XE Cupertino 17.9.2

### Hardware Features in Cisco IOS XE Cupertino 17.9.2

There are no new hardware features in this release.

### Software Features in Cisco IOS XE Cupertino 17.9.2

There are no new software features in this release.

### Hardware and Software Behavior Changes in Cisco IOS XE Cupertino 17.9.2

There are no behavior changes in Cisco IOS XE Cupertino 17.9.2.

## Whats New in Cisco IOS XE Cupertino 17.9.1

### Hardware Features in Cisco IOS XE Cupertino 17.9.1

Feature Name	Description and Documentation Link
Cisco Catalyst 9200 Series Switches (C9200CX)	<p>The following new models have been introduced in the series:</p> <ul style="list-style-type: none"> <li>• C9200CX-8P-2X2G: 8x1G PoE+ ports; 2x1G and 2x10G SFP+ fixed uplink ports; powered using 310W internal power supply unit; fanless.</li> <li>• C9200CX-12P-2X2G: 12x1G PoE+ ports; 2x1G and 2x10G SFP+ fixed uplink ports; powered using 310W internal power supply unit; fanless.</li> <li>• C9200CX-12T-2X2G: 12x1G Ethernet ports; 3x1G and 2x10G SFP+ fixed uplink ports; the last 1G copper uplink port is a Class 6 PD port capable of powering the switch; also supports 80W auxiliary power adapter; fanless.</li> </ul> <p>For more information about the hardware, see the <a href="#">Cisco Catalyst 9200CX Compact Series Switches Hardware Installation Guide</a>.</p>

### Software Features in Cisco IOS XE Cupertino 17.9.1

Feature Name	Description
DHCP Snooping with Egress SPAN on the same interface	Introduces support for configuring concurrent DHCP Snooping and egress SPAN on the same interface for non-SDA deployments.

Feature Name	Description
Programmability <ul style="list-style-type: none"> <li>• YANG Data Models</li> <li>• Pubd Restartability</li> </ul>	The following programmability features are introduced in this release: <ul style="list-style-type: none"> <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/master/vendor/cisco/xe/1791">https://github.com/YangModels/yang/tree/master/vendor/cisco/xe/1791</a>. Revision statements embedded in the YANG files indicate if there has been a model revision. The README.md file in the same GitHub location highlights changes that have been made in the release.</li> <li>• Pubd Restartability: The pubd process is restartable on all platforms in this release. Prior to this release, pubd was restartable only on certain platforms. On other platforms, to restart the pubd process, the whole device had to be restarted.</li> </ul>
Smart Licensing Using Policy <ul style="list-style-type: none"> <li>• New mechanism to send data privacy related information</li> <li>• Hostname support</li> </ul>	The following Smart Licensing Using Policy features are introduced in this release: <ul style="list-style-type: none"> <li>• New mechanism to send data privacy related information: This information is no longer included in a RUM report. If data privacy is disabled (<b>no license smart privacy { all   hostname   version }</b> global configuration command), data privacy related information is sent in a separate sync message or offline file. Depending on the topology you have implemented, the product instance initiates the sending of this information in a separate message, or CSLU and SSM On-Prem initiates the retrieval of this information from the product instance, or this information is saved in the offline file that is generated when you enter the <b>license smart save usage</b> privileged EXEC command.</li> <li>• Hostname support: Support for sending hostname information was introduced. If you configure a hostname on the product instance and disable the corresponding privacy setting (<b>no license smart privacy hostname</b> global configuration command), hostname information is sent from the product instance, in a separate sync message or offline file. Depending on the topology you have implemented, the hostname information is received by CSSM, and CSLU or SSM On-Prem. It is then displayed on the corresponding user interface.</li> </ul>
SMU Installation disabled in bundle mode	Support for SMU installation is disabled in bundle mode. Installation is supported only in install mode.
Support for PI SSH	Cisco IOS SSH Server and Client support for the following encryption algorithms have been introduced: <ul style="list-style-type: none"> <li>• <a href="#">aes128-gcm@openssh.com</a></li> <li>• <a href="#">aes256-gcm@openssh.com</a></li> </ul>
SXP Version 5	SXP version 5 has been designed to export and import SXP mappings between specified SXP peers.

### New on the WebUI

There are no WebUI features in this release.

## Hardware and Software Behavior Changes in Cisco IOS XE Cupertino 17.9.1

Behavior Change	Description
Custom SDM Templates: Default FIB MAC Address Value	The custom FIB MAC address minimum/default value is 16K. The configurable range for the number of 1k entries is 16 to 128.  From Cisco IOS XE Cupertino 17.9.1, this is applicable to <i>all</i> subsequent releases.
DHCP Egress Packets Captured in SPAN Sessions	SPAN sessions capture Dynamic Host Configuration Protocol (DHCP) egress packets when DHCP snooping is enabled on the device.
Inlet Temperature Threshold Values	Yellow and Red thresholds for inlet temperature are modified on Cisco Catalyst 9200CX Series Switches. The new values are: <ul style="list-style-type: none"> <li>• Yellow Threshold: 75 degree celsius</li> <li>• Red Threshold: 85 degree celsius</li> </ul>
Last Reload Reason in <b>show version</b> command output	The <b>show version</b> command output in User EXEC mode is modified. This applies only to stacked switches. Last reload reason does not display error now.
RUM report throttling	For all topologies where the product instance initiates communication, the minimum reporting frequency is throttled to one day. This means the product instance does not send more than one RUM report a day.  The affected topologies are: <i>Connected Directly to CSSM</i> , <i>Connected to CSSM Through CSLU</i> (product instance-initiated communication), <i>CSLU Disconnected from CSSM</i> (product instance-initiated communication), and <i>SSM On-Prem Deployment</i> (product instance-initiated communication).  This resolves the problem of too many RUM reports being generated and sent for certain licenses. It also resolves the memory-related issues and system slow-down that was caused by an excessive generation of RUM reports.  You can override the reporting frequency throttling, by entering the <b>license smart sync</b> command in privileged EXEC mode. This triggers an on-demand synchronization with CSSM or CSLU, or SSM On-Prem, to send and receive any pending data.  RUM report throttling also applies to the Cisco IOS XE Amsterdam 17.3.6 and later releases of the 17.3.x train, and Cisco IOS XE Bengaluru 17.6.4 and later releases of the 17.6.x train. From Cisco IOS XE Cupertino 17.9.1, RUM report throttling is applicable to <i>all</i> subsequent releases.
<b>show logging onboard switch poe</b> command output	The <b>show logging onboard switch poe</b> command output is modified on Cisco Catalyst 9200CX Series Switches. The maximum sensor value is modified.
<b>show vlan mapping</b> command output	The <b>show vlan mapping</b> command output is modified. Information about Five GigabitEthernet interface is displayed in the output.



## CHAPTER 3

# Important Notes

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

## Important Notes

- [Unsupported Features, on page 9](#)
- [Complete List of Supported Features, on page 10](#)
- [Accessing Hidden Commands, on page 10](#)

### Unsupported Features

- Audio Video Bridging (including IEEE802.1AS, IEEE 802.1Qat, and IEEE 802.1Qav)
- Border Gateway Protocol (BGP) including BGP EVPN VXLAN.
- Cisco StackWise Virtual
- Cisco TrustSec Network Device Admission Control (NDAC) on Uplinks
- Converged Access for Branch Deployments
- Fabric Enabled Wireless on C9200L SKUs
- Gateway Load Balancing Protocol (GLBP)
- Hot patching (for SMUs)
- IPsec VPN
- MACSec Encryption
  - MACsec configuration on EtherChannel
  - 256-bit AES MACsec (IEEE 802.1AE) host link encryption with MACsec Key Agreement (MKA)
- Multiprotocol Label Switching (MPLS)
- Non Stop Forwarding (NSF)
- Performance Monitoring (PerfMon)

- Private VLAN (PVLAN) on Trunks and Portchannels
- Programmability (Cisco Plug-in for OpenFlow 1.3, Third-Party Application Hosting)
- Stacking on 9200CX SKUs
- Virtual Routing and Forwarding (VRF)-Aware web authentication
- Web Cache Communication Protocol (WCCP)

### Complete List of Supported Features

For the complete list of features supported on a platform, see the Cisco Feature Navigator at <https://cfng.cisco.com>.

### 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.




---

**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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## CHAPTER 4

# Compatibility Matrix and Web UI System Requirements

- [Compatibility Matrix](#), on page 11
- [Web UI System Requirements](#), on page 16

## Compatibility Matrix

The following table provides software compatibility information.

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> .

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
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> .
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 17.3.7	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> .
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> .

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
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.
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.

Catalyst 9200	Cisco Identity Services Engine	Cisco Prime Infrastructure
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> .
Fuji 16.9.5	2.4	PI 3.4 + Device Pack 7 See <a href="#">Cisco Prime Infrastructure 3.4</a> → <b>Downloads</b> .
Fuji 16.9.4	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 16.9.3	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 17](#)
- [Scaling Guidelines, on page 19](#)

## 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 21](#)

## 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
```
- MACsec is not supported on Software-Defined Access deployments.
- 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.





## CHAPTER 7

# Upgrading the Switch Software

- [Finding the Software Version, on page 25](#)
- [Software Images, on page 25](#)
- [Automatic Boot Loader Upgrade, on page 26](#)
- [Software Installation Commands, on page 26](#)
- [Upgrading in Install Mode, on page 27](#)
- [Downgrading in Install Mode, on page 31](#)

## 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 Cupertino 17.9.3	CAT9K_LITE_IOSXE	cat9k_lite_iosxe.17.09.03.S
Cisco IOS XE Cupertino 17.9.2	CAT9K_LITE_IOSXE	cat9k_lite_iosxe.17.09.02.S
Cisco IOS XE Cupertino 17.9.1	CAT9K_LITE_IOSXE	cat9k_lite_iosxe.17.09.01.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.



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

Scenario	Automatic Boot Loader Response
If you boot Cisco IOS XE Cupertino 17.9.3 for the first time	The boot loader may be upgraded to version 17.9.1r [FC8] For example:  <output truncated> ROM: IOS-XE ROMMON BOOTLDR: System Bootstrap, Version 17.9.1r[FC8], RELEASE SOFTWARE (P) <output truncated>
If you boot Cisco IOS XE Cupertino 17.9.2 for the first time	The boot loader may be upgraded to version 17.9.1r [FC8] For example:  <output truncated> ROM: IOS-XE ROMMON BOOTLDR: System Bootstrap, Version 17.9.1r[FC8], RELEASE SOFTWARE (P) <output truncated>
If you boot Cisco IOS XE Cupertino 17.9.1 for the first time	The boot loader may be upgraded to version 17.8.1r [FC5] For example:  <output truncated> ROM: IOS-XE ROMMON BOOTLDR: System Bootstrap, Version 17.8.1r[FC5], RELEASE SOFTWARE (P) <output truncated>

## 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.

Summary of Software Installation Commands	
<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 Cupertino 17.8.x or earlier releases	Cisco IOS XE Cupertino 17.9.x

The sample output in this section displays upgrade from Cisco IOS XE Cupertino 17.8.1 to Cisco IOS XE Cupertino 17.9.1 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 Jul 25 17:46:18 IST 2022
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.17.08.01.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-rpboot.17.08.01.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-srdriver.17.08.01.SPA.pkg
```

```

File is in use, will not delete.
cat9k_lite-webui.17.08.01.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.17.08.01.SPA.bin

```

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

```

[switch 1]:
Deleting file flash:cat9k_lite_iosxe.17.08.01.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 Jul 25 17:47:20 IST 2022
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.17.09.01.SPA.bin flash:

Destination filename [cat9k_lite_iosxe.17.09.01.SPA.bin]?
Accessing tftp://10.8.0.6//cat9k_lite_iosxe.17.09.01.SPA.bin...
Loading /cat9k_lite_iosxe.17.09.01.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 Jul 25 2022 10:18:11 -07:00 cat9k_lite_iosxe.17.09.01.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 Cupertino 17.9.1 software image in the flash memory:

```
Switch# install add file flash:cat9k_lite_iosxe.17.09.01.SPA.bin activate commit
install_add_activate_commit: START Mon Jul 25 12:51:55 IST 2022
Jul 25 12:51:57.795: %INSTALL-5-INSTALL_START_INFO: R0/0: install_engine: Started install
one-shot flash:cat9k_lite_iosxe.17.09.01.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.17.09.01.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: 17.09.01.0.276
install_add_activate_commit: Activating PACKAGE
```

```

gzip: initramfs.cpio.gz: decompression OK, trailing garbage ignored
Following packages shall be activated:
/flash/cat9k_lite-webui.17.09.01.SPA.pkg
/flash/cat9k_lite-srdriver.17.09.01.SPA.pkg
/flash/cat9k_lite-rpboot.17.09.01.SPA.pkg
/flash/cat9k_lite-rpbase.17.09.01.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
Jul 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.17.08.01.SPA.pkg
    Removed cat9k_lite-rpboot.17.08.01.SPA.pkg
    Removed cat9k_lite-srdriver.17.08.01.SPA.pkg
    Removed cat9k_lite-webui.17.08.01.SPA.pkg
  New files list:
    Added cat9k_lite-rpbase.17.09.01.SPA.pkg
    Added cat9k_lite-rpboot.17.09.01.SPA.pkg
    Added cat9k_lite-srdriver.17.09.01.SPA.pkg
    Added cat9k_lite-webui.17.09.01.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

*Jul 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 Jul 25 13:04:23 IST 2022
Jul 25 13:04:24.586: %INSTALL-5-INSTALL_COMPLETED_INFO: R0/0: install_engine: Completed
install one-shot PACKAGE flash:cat9k_lite_iosxe.17.09.01.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  Apr 20 2022 05:13:32 +00:00  cat9k_lite-rpbase.17.08.01.SPA.pkg

```

```

48585 -rw- 35713901 Apr 20 2022 05:14:12 +00:00 cat9k_lite-rpboot.17.08.01.SPA.pkg
48583 -rw- 4252692 Apr 20 2022 05:13:33 +00:00 cat9k_lite-srdriver.17.08.01.SPA.pkg
48584 -rw- 8119312 Apr 20 2022 05:13:34 +00:00 cat9k_lite-webui.17.08.01.SPA.pkg

16640 -rw- 301188116 Jul 25 2022 05:33:25 +00:00 cat9k_lite-rpbase.17.09.01.SPA.pkg
16647 -rw- 35112025 Jul 25 2022 05:34:06 +00:00 cat9k_lite-rpboot.17.09.01.SPA.pkg
16642 -rw- 4326420 Jul 25 2022 05:33:25 +00:00 cat9k_lite-srdriver.17.09.01.SPA.pkg
16643 -rw- 8328208 Jul 25 2022 05:33:25 +00:00 cat9k_lite-webui.17.09.01.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.17.09.01.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 Jul 25 2022 05:39:42 +00:00 packages.conf
16634 -rw- 4882 Jul 25 2022 05:34:06 +00:00 cat9k_lite_iosxe.17.09.01.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 Cupertino 17.9.1 image on the device:

```

Switch# show version
Cisco IOS XE Software, Version 17.09.01
Cisco IOS Software [Cupertino], Catalyst L3 Switch Software (CAT9K_LITE_IOSXE), Version
 17.9.1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2022 by Cisco Systems, Inc.
Compiled Mon 4-Apr-21 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 Cupertino 17.9.x	Cisco IOS XE Cupertino 17.8.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 Cupertino 17.9.1 to Cisco IOS XE Cupertino 17.8.1, 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 Jul 25 17:46:18 IST 2022
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.17.09.01.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-rpboot.17.09.1.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-srdriver.17.09.1.SPA.pkg
      File is in use, will not delete.
    cat9k_lite-webui.17.09.1.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.17.09.1.SPA.bin

Do you want to remove the above files? [y/n]y
[switch 1]:
Deleting file flash:cat9k_lite_iosxe.17.09.1.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 Jul 25 17:47:20 IST 2022
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.17.08.1.SPA.bin flash:

Destination filename [cat9k_lite_iosxe.17.08.1.SPA.bin]?
Accessing tftp://10.8.0.6//cat9k_lite_iosxe.17.08.1.SPA.bin...
Loading /cat9k_lite_iosxe.17.08.1.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 Jul 25 2022 13:35:16 -07:00 cat9k_lite_iosxe.17.08.1.SPA.bin
11353194496 bytes total (9055866880 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** 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 Cupertino 17.8.1 software image to flash, by using the **install add file activate commit** command.

```

Switch# install add file flash:cat9k_lite_iosxe.17.08.01.SPA.bin activate commit activate
commit

install_add_activate_commit: START Mon Jul 25 13:17:28 IST 2022
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.17.08.01.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: 17.08.01.0.203
install_add_activate_commit: Activating PACKAGE

gzip: initramfs.cpio.gz: decompression OK, trailing garbage ignored
Following packages shall be activated:
/flash/cat9k_lite-webui.17.08.01.SPA.pkg
/flash/cat9k_lite-srdriver.17.08.01.SPA.pkg
/flash/cat9k_lite-rpboot.17.08.01.SPA.pkg
/flash/cat9k_lite-rpbase.17.08.01.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
Jul 25 13:29:31.133: %INSTALL-5-INSTALL_AUTO_ABORT_TIMER_PROGRESS: R0/0: rollback_timer:
Install auto abort timer will expire in 7200 seconds

*Jul 25 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.17.09.01.SPA.pkg
  Removed cat9k_lite-rpboot.17.09.01.SPA.pkg

```

```

Removed cat9k_lite-srdriver.17.09.01.SPA.pkg
Removed cat9k_lite-webui.17.09.01.SPA.pkg
New files list:
  Added cat9k_lite-rpbase.17.08.01.SPA.pkg
  Added cat9k_lite-rpboot.17.08.01.SPA.pkg
  Added cat9k_lite-srdriver.17.08.01.SPA.pkg
  Added cat9k_lite-webui.17.08.01.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 Jul 25 13:30:52 IST 2022
Jul 25 13:30:53.573: %INSTALL-5-INSTALL_COMPLETED_INFO: R0/0: install_engine: Completed
install one-shot PACKAGE flash:cat9k_lite_iosxe.17.08.01.SPA.bin
Jul 25 13:30:53.573: %INSTALL-5-INSTALL_COMPLETED_INFO: R0/0: install_engine: Completed
install one-shot PACKAGE flash:cat9k_lite_iosxe.17.08.01.SPA.bin

switch3#
Chassis 1 reloading, reason - Reload command

*Jul 25 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.17.08.01.SPA.bin
*Jul 25 13:30:54.526 IST: %STACKMGR-1-RELOAD: Switch 1 R0/0: stack_mgr: Reloading due to
reason Reload command Jul 25 13:30:58.121: %PMAN-5-EXITACTION: F0/0: pvp: Process manager
is exiting: reload fp actionrequested
Jul 25 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 Cupertino 17.8.1 image on the device:

```

Switch# show version
Cisco IOS XE Software, Version 17.08.01
Cisco IOS Software [Cupertino], Catalyst L3 Switch Software (CAT9K_LITE_IOSXE), Version
17.8.1, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2022 by Cisco Systems, Inc.
<output truncated>

```







## CHAPTER 8

# Caveats

- [Cisco Bug Search Tool](#), on page 37
- [Open Caveats in Cisco IOS XE Cupertino 17.9.x](#), on page 37
- [Resolved Caveats in Cisco IOS XE Cupertino 17.9.3](#), on page 37
- [Resolved Caveats in Cisco IOS XE Cupertino 17.9.2](#), on page 38
- [Resolved Caveats in Cisco IOS XE Cupertino 17.9.1](#), on page 38

## 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 Cupertino 17.9.x

Identifier	Headline
<a href="#">CSCwc15574</a>	Mgig Cat9200 incrementing FCS-Err/Rcv-Err from 1Gig connection
<a href="#">CSCwc21676</a>	UTF file filling with constant repm-ipc connect/disconnect msgs
<a href="#">CSCwc41288</a>	C9200L input errors and SymbolErr frames counter increased
<a href="#">CSCwe73012</a>	9130/9166 APs do not power up when connected to Gig port of C9200CX switch

## Resolved Caveats in Cisco IOS XE Cupertino 17.9.3

Identifier	Headline
<a href="#">CSCwd56540</a>	Ignore higher fan speed deviations on 9200

## Resolved Caveats in Cisco IOS XE Cupertino 17.9.2

Identifier	Headline
<a href="#">CSCwc84941</a>	Due to signal suppression enabled the map-requests are not sent when below map-cache limit

## Resolved Caveats in Cisco IOS XE Cupertino 17.9.1

Identifier	Headline
<a href="#">CSCvz77502</a>	9200L 10G port led not blinking green under speed mode
<a href="#">CSCwa77415</a>	Switch stack shows wrong neighbor info for stack-ports links
<a href="#">CSCwa23654</a>	Memory leak in Inline Power IOSd process when PoE is used
<a href="#">CSCwb18702</a>	CISCO-ENTITY-SENSOR-MIB is returning wrong threshold values for thermal sensors
<a href="#">CSCwa76242</a>	Cat 9200L - 10G Link Flaps at intermittent times when peer is maintained as Nexus 9K
<a href="#">CSCwa41298</a>	remote switch doesn't detect link down when one rx fiber cable is unplugged on 9200L
<a href="#">CSCwa52014</a>	CISCO-ENHANCED-MEMPOOL-MIB not working on C9200 and C9300



## CHAPTER 9

# Additional Information

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- [Troubleshooting](#), on page 39
- [Related Documentation](#), on page 39
- [Communications, Services, and Additional Information](#), on page 39

## 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: <http://www.cisco.com/go/mibs>

## Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
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- To find warranty information for a specific product or product family, access [Cisco Warranty Finder](#).

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