

# Cisco Catalyst 9500 Series Switches

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## Introduction

### **Reimagine, Reinforce, Redefine**

The Catalyst 9500 Series, including the Catalyst 9500X models, continues to shape the future with continued innovation that helps you reimagine connections, reinforce security and redefine the experience for your hybrid workforce big and small.

Cisco Catalyst 9500 Series switches based on Cisco Unified Access Data Plane (UADP) Application-Specific Integrated Circuit (ASIC) are Cisco's lead fixed enterprise core and aggregation switching platform and as part of the Catalyst 9000 family, are built to transform your network to handle a hybrid world where the workplace is anywhere, endpoints could be anything, and applications are hosted all over the place.

Cisco Catalyst 9500X switch based on Cisco Silicon One Q200 ASIC is purpose built for the next generation core with a programmable pipeline (P4) and is the first network silicon to offer switching capacity up to 12.8 Tbps full duplex in the enterprise. The Q200 ASIC offers high-performance along with full routing and switching capabilities without external memories. This is enabled by internal architecture that includes an on-chip High Bandwidth Memory (HBM). The Catalyst 9500X switch leverages a high-performance multiple core x86 CPU, and is Cisco's leading purpose-built fixed core and edge services enterprise switching platform, built for security, IoT, and cloud.

Cisco Catalyst 9500X switch is the industry's first purpose-built fixed 10, 25, 50, 40, 100, 200 and 400 Gigabit Ethernet switch targeted for the enterprise campus. The Catalyst 9500X switch delivers unmatched forwarding scale (MAC addresses, IP unicast and multicast routes, MPLS labels) and deep buffering for enterprise applications. The Catalyst 9500X models includes non-blocking 50 Gigabit Ethernet Small Form-Factor Pluggable (SFP-56) and non-blocking 400 Gigabit Ethernet Quad Small Form-Factor Pluggable Double Density (QSFP-DD) ports.

Catalyst 9500 Series switches support advanced routing and infrastructure services (such as Multiprotocol Label Switching [MPLS] Layer 2 and Layer 3 VPNs, Multicast VPN [MVPN], and Network Address Translation [NAT]); Cisco Software-Defined Access capabilities (such as a host tracking database, cross-domain connectivity, and VPN Routing and Forwarding [VRF]-aware Locator/ID Separation Protocol [LISP]); and network system virtualization with Cisco StackWise Virtual technology that are critical for their placement in the campus core. The Cisco Catalyst 9500 Series also supports foundational high-availability capabilities such as patching, [Cisco Nonstop Forwarding with Stateful Switchover](#) (NSF/SSO), redundant platinum-rated power supplies, and fans, while supporting a wide array of optics. Catalyst 9500 Series switches provide operational choice of Cisco Catalyst Center, or Meraki cloud monitoring.

### **The foundation of Software-Defined Access**

The enterprise network lies at the heart of digital transformation. A network that is open, programmable, integrated, and secure maximizes business agility, allowing new business opportunities to be pursued and captured.

The Cisco Networking Cloud with [Software-Defined Access](#) (SD-Access) is the network fabric that powers business. Cisco SD-Access is an open and extensible, software-driven architecture that accelerates and simplifies your enterprise network operations. SD-Access enables policy-based automation from edge to cloud with foundational capabilities.

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## Product overview

### Cisco Catalyst 9500X models

- The Cisco [Silicon One Q200](#) Application-Specific Integrated Circuit (ASIC) is purpose built for the next generation network core + edge switch. It is the first enterprise ASIC to offer speeds up to 12.8 Tbps full duplex with 8 Bpps of forwarding performance, while supporting high-performance and full routing and switching capabilities without external memories.
- The Cisco Silicon One Q200 ASIC is built on 7nm fabrication technology, capable of high performance while maintaining a low power footprint.
- Up to 12.8 (switching ASIC capacity) Tbps switching capacity with 8 Bpps forwarding rate.
- 80MB of dedicated low-latency buffer, with up to 8GB of HBM buffer for deep packet buffers.
- Up to 28 native nonblocking 40/100 Gigabit Ethernet QSFP28 ports.
- Up to 60 native nonblocking 10/25/50 Gigabit Ethernet SFP56 ports.
- Up to 8 native nonblocking 40/100/200/400 Gigabit Ethernet QSFPDD ports.
- Intel 2.3-GHz x86 CPU with 8 cores and 32-GB of DDR4 memory.
- Up to 960 GB of SSD local storage for container-based application hosting (2x 10G KR ports).
- Flexible routing (IPv4, IPv6, and multicast) tables, Layer 2 tables, ACL tables, and QoS tables.
- ASIC tables for switching scale up to 256K MAC addresses and routing scale up to 2M routes.
- Dual-stack IPv4/IPv6 and dynamic hardware forwarding table allocations, for ease of IPv4-to-IPv6 migration.
- Hardware support for Application Hosting.
- Hardware support for line-rate 256-bit 802.1ae MACsec and WAN-MACsec data encryption.
- Cisco StackWise Virtual technology, a network system virtualization technology that increases operational efficiency and boosts nonstop communications and scaled system bandwidth. Multichassis EtherChannel can be configured across StackWise-Virtual members for high resiliency.
- Platinum-rated (90% efficient) 1500 Watt AC and/or DC power supplies.
- Field-replaceable, N+1 redundant fan-tray units, with an added flexibility to choose the direction of airflow.

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## Cisco Catalyst 9500 models

- The [Cisco Unified Access Data Plane \(UADP\)](#) Application-Specific Integrated Circuit (ASIC) ready for next-generation technologies with its programmable pipeline, microengine capabilities, and template-based, configurable allocation of Layer 2 and Layer 3 forwarding, Access Control Lists (ACLs), and Quality-of-Service (QoS) entries.
- Up to 6.4 Tbps switching capacity with up to 2 Bpps of forwarding performance.
- Up to 36 MB of unified buffer per ASIC.
- Intel 2.4-GHz x86 CPU with up to 120 GB of USB 3.0 or up to 960 GB of SATA SSD storage for container-based application hosting.
- Up to 32 nonblocking 100 Gigabit Ethernet QSFP28 ports.
- Up to 32 nonblocking 40 Gigabit Ethernet QSFP+ ports.
- Up to 48 nonblocking 25 Gigabit Ethernet SFP28 ports.
- Up to 48 nonblocking 10 Gigabit Ethernet SFP+ ports.
- Scalable Layer 3 routing (IPv4, IPv6, and multicast) tables and Layer 2 switching tables.
- Hardware support for Application Hosting.
- IEEE 802.1ba AV Bridging (AVB) built in to provide a better AV experience through improved time synchronization and QoS.
- Precision Time Protocol (PTP; IEEE 1588v2) provides accurate clock synchronization with sub-microsecond accuracy, making it suitable for distribution and synchronization of time and frequency over the network.
- Support for both static and dynamic NAT and Port Address Translation (PAT).
- Cisco StackWise Virtual technology, a network system virtualization technology that increases operational efficiency and boosts nonstop communications and scaled system bandwidth. Multichassis EtherChannel can be configured across StackWise-Virtual members for high resiliency.
- Platinum-rated (Greater than 90% efficient) AC and/or DC power supplies.
- Field-replaceable fan-tray units.
- Meraki Cloud monitoring option.

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## Cisco IOS XE

This modern operating system for the enterprise provides support for model-driven programmability, on-box Python scripting, streaming telemetry, container-based application hosting, and patching for critical bug fixes. Cisco IOS XE also has built-in defenses to protect against runtime attacks.

- Simplified Campus Automation is designed to optimize the discovery and configuration of devices in your network with a more streamlined simple and easy-to-use automation tool. With features such as simplified discovery, IT can discover devices within the network within just a few steps. Also available is a more streamlined GUI that provides a better simplified view of switch configurations and software details on a port-by-port basis.
- **Cisco Plug and Play (PnP) enabled:** A simple, secure, unified, and integrated offering to ease new branch or campus device rollouts or updates to an existing network.
- **Automated device provisioning:** This is the ability to automate the process of upgrading software images and installing configuration files on Cisco Catalyst switches when they are being deployed in the network for the first time. Cisco provides both turnkey solutions such as Plug and Play (PnP) and off-the-shelf tools such as Zero-Touch Provisioning (ZTP) and Preboot Execution Environment (PXE) that enable an effortless and automated deployment.
- **API-driven configuration:** Modern network switches such the Cisco Catalyst 9500 Series support a wide range of automation features and provide robust open APIs over Network Configuration Protocol (NETCONF, RESTCONF and gNMI) using YANG data models for external tools, both off-the-shelf and custom built, to automatically provision network resources.
- **Granular visibility:** Model-driven telemetry provides a mechanism to stream data from a switch to a destination. The data to be streamed is driven through subscription to a data set in a YANG model. The subscribed data set is streamed out to the destination at configured intervals. Additionally, Cisco IOS XE enables the push model, which provides near- real-time monitoring of the network, leading to quick detection and rectification of failures.
- **Seamless software upgrades and patching:** To enhance OS resilience, Cisco IOS XE supports patching, which provides fixes for critical bugs and security vulnerabilities between regular maintenance releases. This support allows customers to add patches without having to wait for the next maintenance release.
- **Cloud monitoring for Catalyst:** Integrated view of Catalyst 9500 switches, seamlessly integrated into the Meraki dashboard experience. Cloud monitoring provides the ability to view Catalyst 9500 Series switch statistics, configuration, and troubleshooting capabilities. While the switch will be automatically tagged with "Monitor Only" in the dashboard to distinguish from fully managed Meraki switches, "Monitor Only" Catalyst 9500 switch appears and functions very similarly to Meraki MS switches in the dashboard, including a visual representation of connected ports and traffic information. With cloud monitoring, Cisco IOS XE features, configuration and management continues to be done via The various automation mechanisms are outlined above. As a monitoring tool, most operations are read-only. All live troubleshooting capabilities will also not result in persistent changes to configuration following the troubleshooting operation.
- **WebUI:** Embedded GUI-based device-management tool that provides the ability to provision the device, to simplify device deployment and manageability and to enhance the user experience. WebUI comes with the default image. There is no need to enable anything or install any license on the device. You can use WebUI to build a day-1 configuration and from then on monitor and troubleshoot the device without having to know how to use the CLI.

## Platform benefits

Model	Catalyst 9500	Catalyst 9500X
<b>Resiliency and High Availability</b>		
Software Maintenance Upgrade (SMU)	Yes	Yes
Cisco StackWise Virtual	Yes	Yes <sup>3</sup>
Stateful Switchover (SSO)	Yes (SVL)	Yes (SVL) <sup>3</sup>
In-Service Software Upgrade (ISSU)	Yes (SVL)	Yes (SVL) <sup>3</sup>
Graceful Insertion and Removal (GIR)	Yes	Yes
MKA High Availability	Yes	No <sup>1</sup>
<b>Enterprise Security</b>		
Trustworthy Solutions	Yes	Yes
Image Signing	Yes	Yes
Secure Boot	Yes	Yes
Cisco Trust Anchor Module	Yes	Yes
MACsec Encryption (256-bit AES-GCM)	Yes	Yes
Cisco WAN MACsec (256-bit AES-GCM)	No	Yes <sup>2,5</sup>
Object-Group ACLs (IPv4/IPv6)	Yes	Yes <sup>4</sup>
<b>Enterprise QoS</b>		
Modular QoS CLI (MQC)	Yes	Yes
Strict Priority Queuing	Yes	Yes
Class/Color-aware Queuing	Yes (WFQ)	Yes (VoQ)
Policing/Metering	Yes	Yes
Shaping/Bandwidth	Yes	Yes
Hierarchical QoS	Yes (2-level)	Yes (2-level)
<b>IP Routing</b>		
Routing Information Protocol version 2 (RIPv2), and next generation [RIPng]	Yes	Yes
Open Shortest Path First version 2 (OSPFv2), and OSPFv3	Yes	Yes

Model	Catalyst 9500	Catalyst 9500X
Enhanced Interior Gateway Routing Protocol (EIGRP), and EIGRPv6	Yes	Yes
Intermediate System-to-Intermediate System Version 4 (IS-ISv4)	Yes	Yes
Border Gateway Protocol Version 4 (BGPv4), and BGPv6	Yes	Yes
Protocol-Independent Multicast (PIM) Sparse-Mode (PIM-SM)	Yes	Yes
PIM Source-Specific Mode (PIM-SSM)	Yes	Yes
Bidirectional PIM (PIM-BIDIR)	Yes	No <sup>1</sup>
IPv6 routing	Yes	Yes
L3 Routed Sub-Interfaces	Yes	Yes
<b>Multi-Protocol Label Switching (MPLS)</b>		
MPLS L3 VPN	Yes	Yes
Ethernet over MPLS (EoMPLS)	Yes	Yes
Virtual Private LAN Service (VPLS)	Yes	No <sup>1</sup>
MPLS over GRE	Yes	No <sup>1</sup>
MPLS Traffic-Engineering (MPLS-TE)	Yes	Yes
<b>BGP Ethernet VPN (EVPN) VXLAN</b>		
Fabric Spine, Leaf and Border Support	Yes	Yes <sup>3</sup>
L2/L3 Virtual Network Interface (VNI)	Yes	Yes <sup>3</sup>
Distributed Anycast Gateway (Symmetric IRB)	Yes	Yes <sup>3</sup>
Centralized Gateway (Asymmetric IRB)	Yes	No
ESI Multi-Home Support	Yes	No
Tenant Routed Multicast (IPv4/IPv6)	Yes	Yes <sup>3</sup>
L3 Border Handoff: Multi-VRF, MPLS L3VPN	Yes	Yes <sup>3</sup>
L2 Border Handoff: VPLS, EoMPLS L2VPN	Yes	No <sup>1</sup>



Model	Catalyst 9500	Catalyst 9500X
<b>Software-Defined Access (SD-Access)</b>		
Virtual eXtensible LAN (VXLAN)	Yes	Yes
L2 Virtual Network Interface (VNI)	Yes	Yes
L3 Virtual Network Interface (VNI)	Yes	Yes
SDA Control-Plane	Yes	Yes
SDA Border	Yes	Yes
SDA Layer 2 Border	Yes	No
SDA Edge	Yes	No
<b>Flexible NetFlow (FNF)</b>		
FNF IPv4 flow records	Yes	Yes <sup>2</sup> (software)
FNF IPv6 flow records	Yes	Yes <sup>2</sup> (software)
FNF sampler	Yes	Yes <sup>2</sup>
FNF data export	Yes	Yes <sup>2</sup>
NetFlow version 9 (NFv9) export	Yes	Yes <sup>2</sup>
IPFIX export	Yes	Yes <sup>2</sup>
<b>Programmability</b>		
NETCONF	Yes	Yes
RESTCONF	Yes	Yes
gNMI/gNOI	Yes	Yes
YANG Config models	Yes	Yes
YANG Oper models	Yes	Yes
ZTP/PnP	Yes	Yes
<b>Smart Operations</b>		
Bluetooth Ready	Yes	Yes <sup>2</sup>
RFID Tags	Yes	Yes
Blue Beacon	Yes	Yes
Out of Band Device Mgmt	Yes (RJ45 and USB-mini type B)	Yes (RJ-45 and USB-C)

Model	Catalyst 9500	Catalyst 9500X
Meraki Cloud Monitoring	Yes	No

<sup>1</sup> C9500X models: feature is not available at FCS, but it is hardware capable.

<sup>2</sup> C9500X models: minimum IOS XE software release 17.8.1 (C9500X-28C8D) and 17.10.1 (C9500X-60L4D).

<sup>3</sup> C9500X models: minimum IOS XE software release 17.10.1 (C9500X-28C8D) and 17.11.1 (C9600X-60L4D). SSO support requires StackWise Virtual for fixed Catalyst 9500 models. ISSU supported on C9500X models starting with 17.12.1.

<sup>4</sup> C9500X models: Object-Group ACLs are supported only in the ingress direction.

<sup>5</sup> Need to order HSEC Key.

## Platform details

### Switch models and configurations

All switches ship with the 650W,950W,1500W or 1600W AC power supply as default

Figures 1 through 9 show the Cisco Catalyst 9500 Series Switches



**Figure 1.**  
**C9500X-28C8D:** Cisco Catalyst 9500X switch with 28x 40/100G QSFP28 ports + 8x 40/100/200/400G Gigabit Ethernet



**Figure 2.**  
**C9500X-60L4D:** Cisco Catalyst 9500X switch with 60x 10/25/50G Gigabit Ethernet + 4x 40/100/200/400G Gigabit Ethernet



**Figure 3.**  
**C9500-32C:** Cisco Catalyst 9500 Series high-performance switch with 32x 100 Gigabit Ethernet



**Figure 4.**  
**C9500-32QC:** Cisco Catalyst 9500 Series high-performance switch with 32x 40 or 16x100 Gigabit Ethernet



**Figure 5.**  
**C9500-48Y4C:** Cisco Catalyst 9500 Series high-performance switch with 48x 1/10/25G Gigabit Ethernet + 4x 40/100G Uplink



**Figure 6.**  
**C9500-24Y4C:** Cisco Catalyst 9500 Series high-performance switch with 24x 1/10/25G Gigabit Ethernet + 4x 40/100G Uplink



**Figure 7.**  
**C9500-24Q:** Cisco Catalyst 9500 Series switch with 24x 40G Gigabit Ethernet



**Figure 8.**  
**C9500-12Q:** Cisco Catalyst 9500 Series switch with 12x 40G Gigabit Ethernet



**Figure 9.**  
**C9500-40X:** Cisco Catalyst 9500 Series switch with 40x 1/10G Gigabit Ethernet



**Figure 10.**  
**C9500-16X:** Cisco Catalyst 9500 Series switch with 16x 1/10G Gigabit Ethernet

## Switch configurations and port density

Table 1 shows the Cisco Catalyst 9500X switch configurations.

**Table 1.** Cisco Catalyst 9500X switch configurations and port density

Model	Description	1G port density	10/25/50G port density	40/100G port density	400G port density	10/25G port density with breakout cable	50G port density with breakout cable	40G port density with breakout cable	100G port density with breakout cable
<b>C9500X-28C8D</b>	Cisco Catalyst 9500X with 28x100G + 8x400G Gigabit Ethernet	-	-	36	8	88 (120 <sup>1</sup> )	(64 <sup>1</sup> )	36 (60 <sup>1</sup> )	60
<b>C9500X-60L4D</b>	Cisco Catalyst 9500X with 60x50G + 4x400G Gigabit Ethernet	8 <sup>2</sup>	60	4	4	76 (92 <sup>1</sup> )	60 (92 <sup>1</sup> )	4 (16 <sup>1</sup> )	16

<sup>1</sup> Hardware Capable. All numbers in the above table are for a single standalone switch.

<sup>2</sup> C9500X-60L4D only supports SFP-1G-SX/LH optics for 1Gbps. See [Cisco TMG Matrix](#) for details

Table 2 shows the Cisco Catalyst 9500 Series configurations

**Table 2.** Cisco Catalyst 9500 Series configurations and port density

Model	Description	1G port density	10G port density	25G port density	40G port density	100G Port density	10G port density with breakout cable	25G port density with breakout cable
<b>C9500-32C</b>	Cisco Catalyst 9500 Series high-performance 32-port 100 Gigabit Ethernet switch with QSFP28	-	-	-	32	32	96	96
<b>C9500-32QC</b>	Cisco Catalyst 9500 Series high-performance 32-port 40 Gigabit Ethernet switch with QSFP+	-	-	-	32	16	-	-
<b>C9500-48Y4C</b>	Cisco Catalyst 9500 Series high-performance 48-port 1/10/25G Gigabit Ethernet switch with SFP28	48	48	48	4	4	-	-

Model	Description	1G port density	10G port density	25G port density	40G port density	100G Port density	10G port density with breakout cable	25G port density with breakout cable
<b>C9500-24Y4C</b>	Cisco Catalyst 9500 Series high-performance 24-port 1/10/25G Gigabit Ethernet switch with SFP28	24	24	24	4	4	-	-
<b>C9500-24Q</b>	Cisco Catalyst 9500 Series 24-port 40 Gigabit Ethernet switch with QSFP+	-	-	-	24	-	96	-
<b>C9500-12Q</b>	Cisco Catalyst 9500 Series 12-port 40 Gigabit Ethernet switch with QSFP+	-	-	-	12	-	48	-
<b>C9500-40X</b>	Cisco Catalyst 9500 Series 40-port 1/10 Gigabit Ethernet Switch with SFP/SFP+	40+8 <sup>1</sup>	40+8 <sup>1</sup>	-	2	-	8 <sup>1</sup>	-
<b>C9500-16X</b>	Cisco Catalyst 9500 Series 16-port 1/10 Gigabit Ethernet switch with SFP/SFP+	16+8 <sup>1</sup>	16+8 <sup>1</sup>	-	2	-	8 <sup>1</sup>	-

All numbers in the above table are for the standalone switch.

<sup>1</sup> with uplink module.

## Network modules

The Cisco Catalyst 9500 Series Switches support optional network modules for uplink ports on some of the configurations.

The default switch configuration does not include the network module. When you purchase the switch, you can choose from the network modules described in Tables 3 and 4.

**Table 3.** Network module numbers and descriptions

Network module	Description
<b>C9500-NM-8X</b>	Cisco Catalyst 9500 Series Network Module 8-port 1/10 Gigabit Ethernet with SFP/SFP+
<b>C9500-NM-2Q</b>	Cisco Catalyst 9500 Series Network Module 2-port 40 Gigabit Ethernet with QSFP+

**Table 4.** Network module matrix

Model	C9500-NM-8X	C9500-NM-2Q
C9500X-28C8D	No	No
C9500X-60L4D	No	No
C9500-32C	No	No
C9500-32QC	No	No
C9500-48Y4C	No	No
C9500-24Y4C	No	No
C9500-24Q	No	No
C9500-12Q	No	No
C9500-40X	Yes	Yes
C9500-16X	Yes	Yes

Figures 11 and 12 show the available network modules



**Figure 11.** Cisco Catalyst 9500 Series network module 8-port 1/10 Gigabit Ethernet with SFP/SFP+



**Figure 12.** Cisco Catalyst 9500 Series network module 2-port 40 Gigabit Ethernet with QSFP+

## Accessories

The Cisco Catalyst 9500 Series Switches support optional accessories.

The default switch configuration ships with default 19” brackets. The accessories mentioned below need to be selected during configuration and ordered separately.



**Table 5.** Accessories and descriptions

Product number	Description
<b>C9500X-ACCKIT-19I=</b>	Accessory Kit for Cisco Catalyst 9500X Switch - 19" rack mount <sup>1</sup>
<b>C9500X-ACCKIT-23I=</b>	Accessory Kit for Cisco Catalyst 9500X Switch - 23" rack mount <sup>1</sup>
<b>C9500X-4PTH-KIT=</b>	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500X Switch <sup>1</sup>
<b>C9500-ACCKITH-19I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - High-End - 19" rack mount
<b>C9500-ACCKITH-23I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - High-End - 23" rack mount
<b>C9500-4PTH-KIT=</b>	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series - High-End
<b>C9500-ACC-KIT-19I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - 19" rack mount
<b>C9500-ACC-KIT-23I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - 23" rack mount
<b>C9500-4PT-KIT=</b>	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series
<b>SSD-120G</b>	Cisco pluggable USB3.0 SSD storage - 120 GB
<b>C9K-F3-SSD-240GB</b>	Cisco pluggable SSD storage - 240 GB (Catalyst 9500X) <sup>1</sup>
<b>C9K-F3-SSD-480GB</b>	Cisco pluggable SSD storage - 480 GB (Catalyst 9500X) <sup>1</sup>
<b>C9K-F3-SSD-960GB</b>	Cisco pluggable SSD storage - 960 GB (Catalyst 9500X) <sup>1</sup>
<b>C9K-F1-SSD-240G</b>	Cisco pluggable SSD storage - 240 GB
<b>C9K-F1-SSD-480G</b>	Cisco pluggable SSD storage - 480 GB
<b>C9K-F1-SSD-960G</b>	Cisco pluggable SSD storage - 960 GB

<sup>1</sup> Only supported on Catalyst C9500X models

**Table 6.** Accessory matrix

Model	C9500-ACCKITH-19I=	C9500-ACCKITH-23I=	C9500-4PTH-KIT=	C9500-ACC-KIT-19I=	C9500-ACC-KIT-23I=	C9500-4PT-KIT=	C9K-F1-SSD-240G	C9K-F1-SSD-480G	C9K-F1-SSD-960G
<b>C9500-32C</b>	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
<b>C9500-32QC</b>	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
<b>C9500-48Y4C</b>	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
<b>C9500-24Y4C</b>	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
<b>C9500-24Q</b>	No	No	No	Yes	Yes	Yes	No	No	No
<b>C9500-12Q</b>	No	No	No	Yes	Yes	Yes	No	No	No
<b>C9500-40X</b>	No	No	No	Yes	Yes	Yes	No	No	No

Model	C9500-ACCKITH-19I=	C9500-ACCKITH-23I=	C9500-4PTH-KIT=	C9500-ACC-KIT-19I=	C9500-ACC-KIT-23I=	C9500-4PT-KIT=	C9K-F1-SSD-240G	C9K-F1-SSD-480G	C9K-F1-SSD-960G
<b>C9500-16X</b>	No	No	No	Yes	Yes	Yes	No	No	No

Catalyst 9500X models have their own Accessory kits and SSD storage.

Refer to the [Catalyst 9500 Hardware Installation Guide – Installing SSD Modules](#) for more information.

For C9500 high performance (C9500-24Y4C, C9500-48Y4C, C9500-32C, C9500-32QC) and C9500X switches, RFID tag is an optional selection. RFID tag can be opted out with the selection of C9500-RFID-NONE. RFID tag can be opted in by selecting C9500-RFID for C9500 high performance (C9500-24Y4C, C9500-48Y4C, C9500-32C, C9500-32QC) switches and C9500X-RFID for C9500X switches. UADP 2.0 based C9500-16X is shipped with RFID tags.

**Note:** For C9500 high performance (C9500-24Y4C, C9500-48Y4C, C9500-32C, C9500-32QC) and C9500X switches, it is important to make the right selection for RFID opt in / opt out at the time of ordering. RFID cannot be installed later, in case opted out at the time of ordering.

## Power supplies and fan tray

The Cisco Catalyst 9500 Series Switches support dual 1+1 redundant power supplies (AC or DC). The switches ship with one power supply by default. The second power supply can be purchased at the time the switch is ordered or at a later time. If only one power supply is installed, it should always be in power supply bay #1.

The Catalyst 9500 Series ship with up to five field-replaceable variable-speed fans. These have front-to-back airflow and can operate with up to one individual fan failure. The fan trays support fan-tray Online Insertion and Removal (OIR) and can support a maximum fan speed of up to 24,000 rpm.

Catalyst 9500X models ship with six field-replaceable variable-speed fan units. By default these have front-to-back (port-side intake) airflow fan units. The switch also has the option to select six back-to-front (port-side exhaust) airflow fans (for reversible airflow: either front-to-back or back-to-front). This unique innovation enables the Catalyst 9500X to adjust the fan directions on the power supplies, based on preferred air flow.

**Note:** All Catalyst 9500X fan units must be the same type (either front-to-back or back-to-front). Mix and match of fan trays (front-to-back or back-to-front) is not supported.

**Table 7.** C9500X Fan Options

Product number	Description
<b>C9500X-FAN-1U-R</b>	Catalyst 9500X front to back cooling fan (maximum 6 per switch)
<b>C9500X-FAN-1U-F</b>	Catalyst 9500X back to front cooling fan (maximum 6 per switch)



Table 8 shows the maximum fans and fan trays for each configuration.

**Table 8.** C9500 Fan and Fan tray matrix

Model	FAN-T4-R (Max # of fans)	C9K-T1-FANTRAY (Max # of fans)
C9500-32C	Yes (5)	No
C9500-32QC	No	Yes (4)
C9500-48Y4C	No	Yes (4)
C9500-24Y4C	No	Yes (4)
C9500-24Q	Yes (5)	No
C9500-12Q	Yes (5)	No
C9500-40X	Yes (5)	No
C9500-16X	Yes (5)	No

Figures 13 to 16 show the power supplies available for the Cisco Catalyst 9500 Series



**Figure 13.**  
950W AC power supply



**Figure 14.**  
650W AC power supply (C9K-PWR-650WAC-R)



**Figure 15.**  
1600W AC power supply



**Figure 16.**  
650W AC power supply (C9K-PWR-650WACL-R)

Tables 9 and 10 provides more details on the Cisco Catalyst 9500X models power supplies.

**Table 9.** C9500X Power supply specifications

Power supply feature	C9K-PWR-1500WAC	C9K-PWR-1500WDC
<b>Power max rating</b>	1500	1500
<b>Input-voltage range and frequency</b>	90-264Vac 47-63Hz	-40Vdc to -72Vdc
<b>Power supply efficiency</b>	92% (115Vac 50% load) 94% (230Vac 50% load)	94% (-48Vdc to -60Vdc, 50% load)
<b>Input current</b>	17A (max) at Vac 100V 7A (max) at Vac 240V	45A (max) at -40Vdc
<b>Output ratings</b>	Main Output: 12V 125A Standby Output: 3.3V 5A	Main Output: 12V 125A Standby Output: 3.3V 5A
<b>Output holdup time</b>	12ms	2ms
<b>Power-supply input receptacles</b>	C22 <sup>1</sup>	C10-638977-00 Amphenol Connector
<b>Power cord rating</b>	16A	N/A

<sup>1</sup> The Catalyst 9500X uses a different AC connector (C21) than the rest of the C9500 Product Family.

**Table 10.** BTU Details for C9500X switches with AC/ DC PSU

Total output BTU (Note: 1000 BTU/hr = 293W) - Model	C9K-PWR-1500WAC	C9K-PWR-1500WDC
<b>C9500X-28C8D</b>	4,034	4,034
<b>C9500X-60L4D</b>	3,412	3,412

Tables 11 and 12 provides more details on the Cisco Catalyst 9500 Series power supplies.

**Table 11.** C9500 Power supply specifications

Power supply feature	PWR-C4-950WAC-R	PWR-C4-950WDC-R	C9K-PWR-650WAC-R	C9K-PWR-650WACL-R	C9K-PWR-930WDC-R	C9K-PWR-1600WAC-R	C9K-PWR-1600WDC-R
<b>Power max rating</b>	950W	950W	650W	650W	930W	1600W	1600W
<b>Input-voltage range and frequency</b>	AC 90 to 264 VAC, 47 to 63 Hz	-36Vdc~ - 72Vdc	AC 90VAC to 264VAC, 47 to 63 Hz	AC 90VAC to 264VAC, 47 to 63 Hz	DC -40VDC to -72VDC	AC 90VAC to 140VAC and 180VAC to 264VAC 47 to 63 Hz	DC -40VDC to -72VDC
<b>Power supply efficiency</b>	94%	91% at 48V <sub>in</sub> , 50% load	94% (Typ)	94% (Typ)	92% (Typ)	94% (Typ)	92% (Typ)
<b>Input current</b>	AC 10A at 115VAC, 5 A at 230VAC	22.6A @ 48V <sub>in</sub> , 950W	AC 6.8A Max at 115VAC, 3.4 A Max at 230VAC (when full loading)	AC 6.8A Max at 115VAC, 3.4 A Max at 230VAC (when full loading)	DC 23A max at -48VDC (when full loading)	AC 10.5A Max at 115VAC (1050W), 7.8 A Max at 230VAC (1600W)	DC 40A max at -48VDC (when full loading)
<b>Output ratings</b>	12V at 79A, 12V at 3A	950W	12V <sub>main</sub> at 54A, 12V <sub>sb</sub> at 3A	12V <sub>main</sub> at 54A, 12V <sub>sb</sub> at 3A	12V <sub>main</sub> at 54A, 12V <sub>sb</sub> at 3A	12V <sub>main</sub> at 133A, 12V <sub>sb</sub> at 3A	12V <sub>main</sub> at 133A, 12V <sub>sb</sub> at 3A
<b>Output holdup time</b>	AC = 10 ms at maximum load	1ms	AC = 20 ms minimum for system	AC = 12 ms minimum at maximum load	AC = 8 ms minimum for system	AC = 20 ms minimum for system	AC = 5 ms minimum for system
<b>Power-supply input receptacles</b>	AC IEC 60320 C16		AC IEC 60320 C14	AC IEC 60320 C14	Molex Minifit 44540-1001	AC IEC 60320 C16	Amphenol C10-638976-000
<b>Power cord rating</b>	AC 15A	DC 40A	AC 10A	AC 10A	DC 40A	AC 15A	DC 70A

**Table 12.** BTU Details for 9500 Power Supplies (BTU/hr)

Total output BTU (Note: 1000 BTU/hr = 293W) - Model	C9K-PWR-1600WAC-R	C9K-PWR-1600WDC-R	C9K-PWR-650WAC-R	C9K-PWR-650WACL-R	C9K-PWR-930WDC-R	PWR-C4-950WAC-R	PWR-C4-950WDC-R
<b>C9500-32C</b>	3,631	3,709	N/A	N/A	N/A	N/A	N/A
<b>C9500-32QC</b>	N/A	N/A	1,815	1,815	1,856	N/A	N/A
<b>C9500-48Y4C</b>	N/A	N/A	1,856	1,856	1,856	N/A	N/A
<b>C9500-24Y4C</b>	N/A	N/A	1,454	1,454	1,484	N/A	N/A
<b>C9500-24Q</b>	N/A	N/A	N/A	N/A	N/A	2,900	2,976

Total output BTU (Note: 1000 BTU/hr = 293W) - Model	C9K-PWR- 1600WAC- R	C9K-PWR- 1600WDC- R	C9K-PWR- 650WAC-R	C9K-PWR- 650WACL- R	C9K-PWR- 930WDC-R	PWR-C4- 950WAC-R	PWR-C4- 950WDC-R
<b>C9500-12Q</b>	N/A	N/A	N/A	N/A	N/A	1,536	1,562
<b>C9500-40X with 10G NM</b>	N/A	N/A	N/A	N/A	N/A	1,467	1,451
<b>C9500-40X with 40G NM</b>	N/A	N/A	N/A	N/A	N/A	1,365	1,376
<b>C9500-16X with 10G NM</b>	N/A	N/A		N/A	N/A	941	967
<b>C9500-16X with 40G NM</b>	N/A	N/A		N/A	N/A	904	930

Table 13 shows the power supplies supported in the Cisco Catalyst 9500 Series Switches.

**Table 13.** C9500 Power supply matrix

Model	C9K-PWR- 1600WAC-R	C9K-PWR- 1600WDC-R	C9K-PWR- 650WAC-R	C9K-PWR- 650WACL-R	C9K-PWR- 930WDC-R	PWR-C4- 950WAC-R	PWR-C4- 950WDC-R
<b>C9500-32C</b>	Yes	Yes	No	No	No	No	No
<b>C9500-32QC</b>	No	No	Yes	Yes	Yes	No	No
<b>C9500-48Y4C</b>	No	No	Yes	Yes	Yes	No	No
<b>C9500-24Y4C</b>	No	No	Yes	Yes	Yes	No	No
<b>C9500-24Q</b>	No	No	No	No	No	Yes	Yes
<b>C9500-12Q</b>	No	No	No	No	No	Yes	Yes
<b>C9500-40X</b>	No	No	No	No	No	Yes	Yes
<b>C9500-16X</b>	No	No	No	No	No	Yes	Yes

Table 14 shows key differences between C9K-PWR-650WAC-R and C9K-PWR-650WACL-R.

**Table 14.** Key differences between C9K-PWR-650WAC-R and C9K-PWR-650WACL-R

Criteria	C9K-PWR-650WAC-R	C9K-PWR-650WACL-R
<b>IEC-61000-4-5 Surge</b>	4KV CM, 2KV DM	2.5KV CM, 1KV DM
<b>AC line Hold-up Time</b>	>=20ms@90% load	>=12ms@100% load
<b>OPP (Over Power Protection)</b>	130% x rated load	140% x rated load

## Switch performance

Table 15 shows performance specifications for the Cisco Catalyst 9500 Series Switches.

**Table 15.** Performance specifications

Performance numbers for all switch models	C9500-24Q	C9500-12Q	C9500-40X	C9500-16X	C9500-32C	C9500-32QC	C9500-48Y4C	C9500-24Y4C	C9500X-28C8D	C9500X-60L4D
ASIC	UADP 2.0				UADP 3.0				Q200	
<b>Switching capacity</b>	Up to 1920 Gbps	Up to 960 Gbps	Up to 960 Gbps	Up to 480 Gbps	Up to 6.4 Tbps <sup>2</sup>	Up to 3.2 Tbps <sup>2</sup>	Up to 3.2 Tbps <sup>2</sup>	Up to 2.0 Tbps <sup>2</sup>	Up to 12 Tbps	Up to 9.2 Tbps
<b>Forwarding rate</b>	Up to 1440 Mpps	Up to 720 Mpps	Up to 720 Mpps	Up to 360 Mpps	Up to 2 Bpps	Up to 1 Bpps	Up to 1 Bpps	Up to 1 Bpps	8 Bpps	8 Bpps
<b>Total MAC addresses</b>	Up to 64,000 <sup>1</sup>				Up to 82,000 <sup>1</sup>				Up to 256,000 <sup>1</sup>	
<b>Total IPv4 routes (indirect routes)</b>	Up to 64,000 indirect <sup>1,6</sup>				Up to 256,000 indirect + direct <sup>1,6</sup>				Up to 2,000,000 <sup>6</sup>	
<b>Total IPv4 host routes (direct routes and ARP)</b>	Up to 80,000 host <sup>1,6</sup>				Up to 90,000 host/ARP <sup>2,6</sup>				Up to 256,000 <sup>1,6</sup>	
<b>Total IPv6 routes (indirect routes)</b>	Up to 32,000 indirect <sup>1,6</sup>				Up to 256,000 indirect + direct <sup>1,6</sup>				Up to 1,000,000 <sup>6</sup>	
<b>Total IPv6 host routes (direct routes and NDP)</b>	Up to 40,000 host <sup>1,6</sup>				Up to 90,000 host <sup>1,6</sup>				Up to 128,000 <sup>1,6</sup>	
<b>Total IPv4 Multicast routes</b>	Up to 32,000 <sup>1,6</sup>				Up to 32,000 <sup>1,6</sup>				Up to 32,000 <sup>1,6</sup>	
<b>Total IPv6 Multicast routes</b>	Up to 16,000 <sup>1,6</sup>				Up to 32,000 <sup>1,6</sup>				Up to 16,000 <sup>1,6</sup>	
<b>QoS ACL scale (v4/v6)</b>	Up to 18,000/9,000 <sup>1</sup>				Up to 16,000/8,000 <sup>1</sup>				Up to 8,000/4,000 <sup>1,7</sup>	
<b>Security ACL scale (v4/v6)</b>	Up to 18,000/9,000 <sup>1</sup>				Up to 27,000/13,500 <sup>1</sup>				Up to 8,000/4,000 <sup>1,7</sup>	
<b>FNF entries</b>	Up to 512,000 <sup>1</sup>				Up to 256,000 <sup>1</sup>				Up to 2,000,000 <sup>5</sup>	
<b>DRAM</b>	16 GB				16 GB				32 GB	
<b>Flash</b>	16 GB				16 GB				32 GB	
<b>VLAN IDs</b>	4,094				4,094				4,094	
<b>PVST Instances</b>	300 <sup>3</sup>				4,000 <sup>1</sup>				4,094	

Performance numbers for all switch models	C9500-24Q	C9500-12Q	C9500-40X	C9500-16X	C9500-32C	C9500-32QC	C9500-48Y4C	C9500-24Y4C	C9500X-28C8D	C9500X-60L4D
ASIC	UADP 2.0				UADP 3.0				Q200	
<b>STP Virtual Ports (Port* VLANs) for PVST</b>	13,000				16,000				16,000	
<b>STP Virtual Ports (Port* VLANs) for MST</b>	13,000				100,000 <sup>4</sup>				32,000	
<b>Total Switched Virtual Interfaces (SVIs)</b>	1,000				4,000 <sup>1</sup>				3800	
<b>Jumbo frame</b>	9,198 bytes				9,216 bytes				9,216 bytes	

<sup>1</sup> Varies based on selected flexible ASIC template and platform.

<sup>2</sup> Line rate for 187byte packet size and above.

<sup>3</sup> 300 with IOS XE release 17.1.1 or later. 256 with IOS XE 16.12.x and 16.11.x 128 with IOS XE 16.10.x or earlier.

<sup>4</sup> 100,000 with IOSXE release 17.5.1 or later. With IOS XE 17.4.1 or earlier: 32,000 with C9500-32C and C9500-32QC; 52,000 with C9500-48Y4C; 28,000 with C9500-24Y4C.

<sup>5</sup> Flexible Netflow requires IOS XE release 17.8.1 or later.

<sup>6</sup> Table Maximum. The exact % of allocation will depend on specific IP/mask combinations.

<sup>7</sup> Table Maximum. Shared hardware resource. Maximum ACEs depends on number and type of ACLs configured across various interface types.

## Important notes

Directly-connected (or host) IP routes mean any /32 or /128 routes, including those are learned indirectly (clients attached to switch's own VLAN/SVI and those /32 prefixes learned over any routing protocols, such as over OSPF).

Indirectly-connected (or advertised) IP routes are subnet routes with a prefix other than /32 or 128 (for example: /8, /16, /24, etc).

UADP 2.0 based C9500-12Q, C9500-24Q, C9500-40X, and C9500-16X support 32,000 adjacency in hardware. So, they can support up to ~32,000 directly attached clients (including all adjacency) in their own VLAN/SVI.

UADP 3.0 based C9500-32C, 32QC, 24Y4C, and 48Y4C support 80,000 adjacency for SVI, with SDM template of distribution and 90,000 direct routes for all supported templates when a Layer 3 routed port is used.

In both UADP 3.0 and S1 Q200 models, the exact hardware programming (hash efficiency) of IP/mask entries depends on the specific number and type of IP/mask prefixes.

## Flexible ASIC templates

Cisco Catalyst 9000 series switches use flexible Software Database Manager (SDM) ASIC templates to enable universal deployments by leveraging the UADP's ability to create resources to optimize table sizes for different places in the network. Based on how the switch is used in the network, an appropriate SDM ASIC template may be selected to configure the switch for specific features.

### Catalyst 9500X models

Cisco Catalyst 9500X models support the following SDM ASIC templates

- Default (Core)
- Custom

Table 16 describes the default SDM ASIC template for C9500X models.

**Table 16.** SDM template descriptions for C9500X models

Features	Default Template
MAC Addresses	128,000
IP Host Routes <sup>1</sup>	128,000
IP LPM Routes <sup>1,2</sup>	2,000,000
IP Multicast Routes <sup>1</sup>	32,000
IGMP/MLD Snooping <sup>1</sup>	16,000
MPLS Labels <sup>3</sup>	256,000
Security/Object Groups	32,000
Security ACLs <sup>1</sup>	8,000
QoS ACLs <sup>1</sup>	8,000
PBR	16,000
GRE Tunnels	1,024
Sampled NetFlow entries <sup>1</sup>	2,000,000

<sup>1</sup> IPv4 and IPv6 entries coexist in the same tables, but IPv6 entries require two entries.

<sup>2</sup> LPM entries are stored as a hash and efficiency is dependent on the actual routes learnt. C9500X hashing efficiency has been improved in 17.12.2.

<sup>3</sup> Per-prefix MPLS labels are limited to 62,000 on C9500X.

## Catalyst 9500 models

The following SDM ASIC templates are supported on the Cisco Catalyst 9500 Series.

- **Distribution:** Maximizes system resources for MAC and security.
- **Core:** Maximizes system resources for unicast and multicast routing.
- **SDA:** Maximizes system resources to support fabric deployment.
- **NAT:** Maximizes system resources for Layer 3 and NAT for support collapsed core WAN deployments.

Table 17 describes the standard SDM ASIC templates for C9500 models.

**Table 17.** SDM template descriptions for C9500 models

Template numbers for models C9500-32C, C9500-32QC, C9500-24Y4C, C9500-48Y4C	Distribution template	Core template (Default)	NAT template	SDA template <sup>2</sup>
IPv4/IPv6(LPM/Host)	114,000	212,000	212,000	212,000
Multicast route(IPv4/IPv6)	16,000	32,000	32,000	32,000
IGMP/MLD snooping	2,000	2,000	2,000	2,000
MAC addresses	82,000	32,000	32,000	32,000
MPLS/SGT label	<b>32,000</b>	<b>32,000</b>	<b>32,000</b>	<b>32,000</b>
NetFlow/ASIC	<b>98,000</b>	<b>64,000</b>	<b>64,000</b>	<b>64,000</b>
Security ACL	27,000 <sup>1</sup>	27,000 <sup>1</sup>	20,000 <sup>1</sup>	27,000 <sup>1</sup>
QoS ACL	16,000 <sup>1</sup>	16,000 <sup>1</sup>	8,000 <sup>1</sup>	16,000 <sup>1</sup>
PBR/NAT	3,000	3,000	15,500	2,000
Tunnel/MACsec	3,000	3,000	2,000	3,000
LISP	1,000	1,000	1,000	2,000
SPAN	1,000	1,000	1,000	1,000
STP Instances	1,000	1,000	1,000	1,000
Control Plane Policing (CoPP)	1,000	1,000	1,000	1,000
NetFlow ACL	1,000 ingress, 1,000 egress	1,000 ingress, 1,000 egress	1,000 ingress, 1,000 egress	1,000 ingress, 1,000 egress



Template numbers for models C9500-12Q, C9500-24Q, C9500-40X, C9500-16X	Distribution template (Default)	Core template	NAT template	SDA template <sup>2</sup>
<b>IPv4/IPv6 LPM</b>	64,000 / 32,000	64,000 / 32,000	64,000 / 32,000	64,000 / 32,000
<b>IPv4/IPv6 host</b>	48,000 / 24,000	32,000 / 16,000	48,000 / 24,000	80,000 / 40,000
<b>IPv4/ IPv6 Multicast route</b>	16,000 / 8,000	32,000 / 16,000	32,000 / 16,000	16,000 / 8,000
<b>IGMP/MLD snooping</b>	16,000	16,000	16,000	16,000
<b>MAC address</b>	64,000	16,000	16,000	16,000
<b>SGT label</b>	8,000	8,000	8,000	8,000
<b>NetFlow/ASIC</b>	128,000	128,000	128,000	128,000
<b>Security ACL</b>	18,000	18,000	18,000	18,000
<b>QoS ACL</b>	18,000	18,000	3000	18,000
<b>PBR/NAT</b>	2,000	2,000	16,000	2,000
<b>Tunnel/MACsec</b>	1,000	1,000	1,000	1,000
<b>LISP</b>	1,000	1,000	1,000	1,000
<b>SPAN</b>	1,000	1,000	1,000	1,000
<b>STP instances</b>	300 <sup>3</sup>	300 <sup>3</sup>	300 <sup>3</sup>	300 <sup>3</sup>
<b>CoPP</b>	1,000	1,000	1,000	1,000
<b>NetFlow ACL</b>	1,000 ingress, 2,000 egress	1,000 ingress, 2,000 egress	1,000 ingress, 2,000 egress	1,000 ingress, 2,000 egress

<sup>1</sup> ACL allocation is configurable between ingress, egress, IPv4 and non IPv4 (layer 2 and IPv6).

<sup>2</sup> SD-Access template has been removed from IOS XE 17.3.1 onwards (in lieu of Custom ASIC templates).

<sup>3</sup> 300 with IOS XE release 17.1.1 or later. 256 with IOS XE 16.12.x and 16.11.x 128 with IOS XE 16.10.x or earlier.

## Custom ASIC templates

### Catalyst 9500X Models (C9500X-28C8D and C9500X-60L4D)

Beginning with the Cisco IOS XE 17.7.1 release, a custom SDM template allows you to configure several features of the template based on your requirements and not the location of the device in the network.

**Table 18.** Custom template FIB configurable values

Features	Default Value	Scale Values (Min - Max)	Step Units
MAC Addresses	128,000	32,000 <sup>1</sup> - 256,000	1,000
IPv4 Host Routes	32,000	32,000 <sup>1</sup> - 256,000	1,000
IPv6 Host Routes	16,000	16,000 <sup>1</sup> - 128,000	1,000
MPLS Labels <sup>3</sup>	256,000	0 <sup>2</sup> - 512,000	1,000
Security/Object Groups	32,000	0 <sup>2</sup> - 64,000	1,000
<b>Total Resources</b>	608,000		

<sup>1</sup> Critical features require a minimum allocation to insure operation. If a custom value is not defined, this value is used.

<sup>2</sup> Some (non-critical) features are allowed to have a 0 entry allocation, to allow increased allocation of other features.

<sup>3</sup> Per-prefix MPLS labels are limited to 62,000 on C9500X.

Learn more about configuring [Custom SDM](#) templates.

### C9500-32C, C9500-32QC, C9500-24Y4C, C9500-48Y4C

Standard SDM templates can be used to configure system resources and optimize support for specific features. However SDM templates are defined based on how the device is deployed in the network.

Beginning with the Cisco IOS XE 17.3.1 release, a custom SDM template will allow you to configure the features of the template based on your requirements and not the location of the device in the network.

**Table 19.** Custom template configurable FIB values

Features	Scale Values (Min - Max)	Step Units	Default Value
MAC addresses	32,000 - 128,000	16,000	32,000
IPv4/IPv6 routes	64,000 - 256,000	16,000	64,000
Multicast routes <sup>1</sup>	0 - 32,000	16,000	16,000
IGMP/MLD Snooping <sup>1</sup>	0 - 32,000	16,000	16,000
SGT/MPLS labels <sup>2</sup>	0 - 64,000	32,000	32,000
Netflow entries - Input <sup>3</sup>	0 - 64,000	32,000	32,000
Netflow entries - Output <sup>3</sup>	0 - 64,000	32,000	0

Features	Scale Values (Min - Max)	Step Units	Default Value
<b>Total Resources</b>	416,000		

<sup>1</sup> Total Layer 2 and Layer 3 Multicast entries may not exceed 48,000.

<sup>2</sup> Each resource holds two SGT + MPLS entries.

<sup>3</sup> NetFlow entries require double entries.

**Table 20.** Custom template configurable ACL values

Features	Scale Values (Min - Max)	Step Units	Default Value
<b>Security ACL - Input</b>	4K-26K, 27K	2K	4K
<b>Security ACL - Output</b>	4K-26K, 27K	2K	4K
<b>QoS ACL - Input</b>	1K, 2K-16K	2K	1K
<b>QoS ACL - Output</b>	1K, 2K-16K	2K	1K
<b>PBR/NAT</b>	1K, 2K-16K	2K	2K
<b>Netflow ACL</b>	1K-2K	1K	1K
<b>LISP</b>	1K-2K	1K	1K
<b>TUNNELS</b>	1K-2K	1K	1K
<b>Total Resources</b>	<b>54k</b>		

Learn more about configuring [Custom SDM](#) templates.

## Software requirements

The Cisco Catalyst 9500 Series Switches run on Cisco IOS XE Software version 16.5.1a or later. This software release includes all the features listed earlier in the Platform Benefits section. Table 20 lists the minimum software requirements for the switch models.

**Table 21.** Minimum software requirements

Model	Description	Minimum software requirement
<b>C9500X-28C8D</b>	Cisco Catalyst 9500X Switch with 28x 100G + 8x 400G Gigabit Ethernet	Cisco IOS XE Software Release 17.7.1
<b>C9500X-60L4D</b>	Cisco Catalyst 9500X Switch with 60x 50G + 4x 400G Gigabit Ethernet	Cisco IOS XE Software Release 17.10.1
<b>C9500-32C</b>	Cisco Catalyst 9500 Series 32-port 40/100 Gigabit Ethernet with QSFP+/QSFP28	Cisco IOS XE Software Release 16.8.1a
<b>C9500-32QC</b>	Cisco Catalyst 9500 Series 32-port 40 Gigabit Ethernet with QSFP+ / 16- port 100 Gigabit Ethernet with QSFP28	Cisco IOS XE Software Release 16.8.1a

Model	Description	Minimum software requirement
<b>C9500-48Y4C</b>	Cisco Catalyst 9500 Series high-performance 48-port 1/10/25G Gigabit Ethernet switch with SFP/SFP+/SFP28	Cisco IOS XE Software Release 16.8.1a
<b>C9500-24Y4C</b>	Cisco Catalyst 9500 Series high-performance 24-port 1/10/25G Gigabit Ethernet switch with SFP/SFP+/SFP28	Cisco IOS XE Software Release 16.8.1a
<b>C9500-24Q</b>	Cisco Catalyst 9500 Series 24-port 40 Gigabit Ethernet with QSFP+	Open Cisco IOS XE Software Release 16.5.1a
<b>C9500-12Q</b>	Cisco Catalyst 9500 Series 12-port 40 Gigabit Ethernet with QSFP+	Open Cisco IOS XE Software Release 16.6.1
<b>C9500-40X</b>	Cisco Catalyst 9500 Series 40-port 1/10 Gigabit Ethernet with SFP/SFP+	Open Cisco IOS XE Software Release 16.6.1
<b>C9500-16X</b>	Cisco Catalyst 9500 Series 16-port 1/10 Gigabit Ethernet with SFP/SFP+	Open Cisco IOS XE Software Release 16.8.1

## Licensing

### Introduction to Smart Licensing

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure – you control what users can access. With Smart Licensing you get:

- **Easy Activation:** Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (Product Activation Keys).
- **Unified Management:** My Cisco Entitlements (MCE) provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License Flexibility:** Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.
- **Smart Licensing Using Policy (SLUP):** Enhanced version of Smart Licensing, with the overarching objective of providing a licensing solution that does not interrupt the operations of your network, rather, one that enables a compliance relationship to account for the hardware and software licenses you purchase and use.

To use Smart Licensing, you must first set up a Smart Account on Cisco Software Central ([software.cisco.com](https://software.cisco.com)).

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

## Software licenses

	Cisco Catalyst Software Subscription new	Cisco DNA subscription	Network Advantage	Network Essentials
<b>Packages<sup>1</sup></b>	3, 5 or 7 Year Terms	3, 5 or 7 Year Terms	Perpetual	Perpetual
<b>Tiers</b>	Advantage, Essentials	Advantage, Essentials	Advantage, Essentials	Advantage, Essentials
<b>Portability<sup>2</sup></b>	✓	✓	✓	✓
<b>Management options</b>	Catalyst Center, Meraki Dashboard	Catalyst Center, Meraki Dashboard	CLI, Web UI	CLI, Web UI
<b>Included support</b>	Base product-level support for Hardware, Software and OS	Software support (SWSS)	X	X
<b>Included<sup>3</sup> add-ons: Common ISE policy, Thousand Eyes network and application assurance, Cisco Spaces</b>	X	X	X	X
<b>Included ISE endpoint licenses</b>	10	X	X	X

<sup>1</sup> For all new orders, subscription licenses are mandatory and must be of the same tier as network licenses

<sup>2</sup> Portability within the same Catalyst 9K series of hardware

<sup>3</sup> Only available with Advantage tier

## Network Essentials and Advantage package features

Features	Network Essentials	Network Advantage
<b>Switch fundamentals</b> Layer 2, Routed Access (RIP, EIGRP Stub, OSPF – Up to 1000 routes),PBR, PIM Stub Multicast (up to 1000 routes)), PVLAN <sup>2</sup> , VRRP, PBR <sup>3</sup> , CDP, QoS, FHS, 802.1x <sup>2</sup> , Macsec-128, CoPP, SXP, IP SLA Responder, SSO	Yes	Yes
<b>Advanced switch capabilities and scale</b> BGP, EIGRP, HSRP, IS-IS, BSR, MSDP, PIM SM, PIM SSM, PIM-BIDIR <sup>2</sup> , IP SLA, OSPF	No	Yes
<b>Network segmentation</b> VRF, VXLAN, LISP, BGP-EVPN <sup>3</sup> , TrustSec/CMD <sup>3</sup> , SGT, MPLS, mVPN <sup>2</sup>	No	Yes
<b>Automation</b> NETCONF, RESTCONF, gRPC, gNMI/gNOI, YANG, PnP Agent, ZTP/Open PnP, GuestShell (On-Box Python)	Yes	Yes
<b>Telemetry and visibility</b> Model-driven telemetry, sampled NetFlow, SPAN, RSPAN	Yes	Yes

Features	Network Essentials	Network Advantage
<b>High availability and resiliency</b> GIR, NSF, ISSU <sup>3</sup> , StackWise Virtual <sup>3</sup> , SMU	No	Yes
<b>IoT integration</b> PTP <sup>2</sup> (IEEE1588v2)	No	Yes
<b>Security</b> MACsec-256, WAN MACsec <sup>1, 4</sup>	No	Yes
<b>Cisco trustworthy solutions</b> Trust Anchor module, Secure Boot, Image Signing, Modern Crypto, Runtime Defenses	Yes	Yes

### Cisco Catalyst Essentials and Advantage package features

Features	Cisco Catalyst Essentials	Cisco Catalyst Advantage	Cisco DNA Essentials	Cisco DNA Advantage
<b>Switch features</b>				
<b>Optimized network deployments</b> Cisco Catalyst Service for Bonjour <sup>3</sup>	No	Yes	No	Yes
<b>Advanced telemetry and visibility</b> Flexible NetFlow <sup>3</sup> , EEM	Yes	Yes	Yes	Yes
<b>Optimized telemetry a visibility</b> ERSPAN <sup>2</sup> , App Hosting (in Containers/VMs), Wireshark, ThousandEyes	No	Yes	No	Yes
<b>Cisco Catalyst Center features (formerly Cisco DNA Center)</b>				
<b>Simplified Campus Automation</b> Simplified Campus Automation optimizes the discovery and configuration of devices in your network with a more streamlined simple and easy-to-use automation tool.	Yes	Yes	Yes	Yes
<b>Day 0 network bring-up automation</b> Cisco Network Plug-n-Play application, network settings, device credentials, LAN Automation, Host onboarding	Yes	Yes	Yes	Yes
<b>Element management</b> Discovery, inventory, topology, software image, licensing, and configuration management	Yes	Yes	Yes	Yes
<b>Element management</b> Patch Management	No	Yes	No	Yes

Features	Cisco Catalyst Essentials	Cisco Catalyst Advantage	Cisco DNA Essentials	Cisco DNA Advantage
<b>Basic Assurance</b> Health Dashboards – Network, Client, Application; Switch and Wired Client Health Monitoring	Yes	Yes	Yes	Yes
<b>SD-Access</b> Policy-based Automation and Assurance for Wired and Wireless	No	Yes	No	Yes
<b>Embedded Wireless (with or w/o SD-Access)<sup>2</sup></b> Cisco Catalyst 9800 wireless software package to enable wireless controller functionality**	No	Yes	No	Yes
<b>Network assurance and analytics</b> Global Insights, Trends, Compliance, Custom Reports; Switch 360, Wired Client 360; Fabric and Non-Fabric Insights; App Health	No	Yes	No	Yes
<b>Meraki Cloud Monitoring<sup>2</sup></b>	Yes* limited device visibility	Yes	Yes* limited device visibility	Yes

\* Feature may be available in future software releases.

\*\* Note: Purchase of Cisco Catalyst Advantage per access point is required to enable the wireless controller function on Catalyst switches.

<sup>1</sup> Not supported on C9500 UADP based models.

<sup>2</sup> Not supported on C9500X models.

<sup>3</sup> Supported in later IOSXE software versions. Refer to latest [Catalyst 9500 Release Notes](#).

<sup>4</sup> Need to order HSEC Key.

For a full list of network stack features as well as Cisco Catalyst Advantage features, please visit: [https://www.cisco.com/c/m/en\\_us/products/software/dna-subscription-switching/en-sw-sub-matrix-switching.html?OID=otren019471](https://www.cisco.com/c/m/en_us/products/software/dna-subscription-switching/en-sw-sub-matrix-switching.html?OID=otren019471).

**Managing licenses with Smart Accounts:** Creating Smart Accounts by using the Cisco Smart Software Manager (SSM) enables you to manage your software licenses from a centralized website. You can set up Cisco SSM to receive daily email alerts and to be notified of expiring subscription licenses that you want to renew.

You must order a Cisco DNA or Cisco Catalyst subscription term license in order to purchase a Catalyst 9500 Series switch. When the license term expires, you can either renew the add-on license to continue using it or deactivate the add-on license and then reload the switch to continue operating with the base license capabilities.

Both the base and add-on licenses are also available for a 90-day evaluation period. An evaluation license is activated temporarily, without purchase. An expired evaluation license cannot be reactivated after reload.

## Specifications

### Dimensions, physical specifications and weight

#### Catalyst 9500X models

Table 22 lists the dimensions, specifications, weight and operating temperature for the Cisco Catalyst 9500X models.

**Table 22.** Dimensions, physical specifications, weight and operating temperature

Description	Specifications	
<b>SKU</b>	C9500X-28C8D	C9500X-60L4D
<b>Dimensions (H x W x D)</b>	H = 1.73" (4.39 cm) W = 17.5" (44.45 cm) D = 21.8" (55.37 cm) including Fan/Tray Handles	H = 1.73" (4.39 cm) W = 17.5" (44.45 cm) D = 21.8" (55.37 cm) including Fan/Tray Handles
<b>Rack Units (RU)</b>	1 RU	1RU
<b>Chassis with 2 power supplies and built-in fan</b>	29.27 lbs (13.28kg) Weights separated: Chassis = 22.13 lbs (10.04kg) Each Fan Tray = 0.26 lbs (0.12kg)  AC PSU = 2.77 lbs (1.26kg) DC PSU = 2.71 lbs (1.23kg)	28.10 lbs (12.75kg) Weights separated: Chassis = 20.96 lbs (9.51kg) Each Fan Tray = 0.26 lbs (0.12kg)  AC PSU = 2.77 lbs (1.26kg) DC PSU = 2.71 lbs (1.23kg)
<b>Input voltage</b>	See <a href="#">Table 3</a>	
<b>Operating temperature</b>	-5° C to +45° C (23° to 133° F) sea level when using the C9500X-FAN-1U-R FAN. -5° C to +35° C (23° to 95° F) sea level when using the C9500X-FAN-1U-F FAN.	
<b>Altitude</b>	If system is configured with a C9500X-FAN-1U-R fan: -5° C to +40° C (23° to 104 F) up to 6,000 feet (1800 m) -5° C to +35° C (23° to 95° F) up to 10,000 feet (3000 m)  If system is configured with a C9500X-FAN-1U-F fan: -5° C to +30° C (23° to 86° F) up to 6,000 feet (1800 m) -5° C to +25° C (23° to 77° F) up to 10,000 feet (3000 m)	
<b>Storage temperature</b>	-40° C to 70° C (-40° to 158° F)	
<b>Relative humidity operating and nonoperating (noncondensing)</b>	Relative humidity operating: 10 to 85% (noncondensing) Relative humidity nonoperating: 0 to 95% (noncondensing)	



## Catalyst 9500 models

Table 23 lists the dimensions, specifications, weight and operating temperature for the Cisco Catalyst 9500 models.

**Table 23.** Dimensions, physical specifications, weight and operating temperature

Description	Specifications							
<b>SKU</b>	C9500-32C	C9500-32QC	C9500-48YC	C9500-24YC	C9500-12Q	C9500-24Q	C9500-40X	C9500-16X
<b>Chassis with 2 power supplies and built-in fan</b>	25.64 lbs (11.63 kg)	21.85 lbs (9.91 kg)	21.96 lbs (9.96 kg)	20.99 lbs (9.52 kg)	25.75 lbs (11.68 kg)			23.6 lbs (10.7 kg)
<b>Dimensions (H x W x D)</b>	1.73 x 17.5 x 21.2 in	1.73 x 17.5 x 18.0 in			1.73 x 17.5 x 21.52 in			
<b>Rack Units (RU)</b>	1 RU							
<b>Chassis with 2 power supplies and built-in fan</b>	25.64 lb (11.63 kg)	21.96 lb (9.96 kg)			25.75 lb (11.68 kg)		23.6 lb (10.7 kg)	
<b>Input voltage</b>	90 to 264 VAC*							
<b>Operating temperature</b>	32° to 104° F (0° to 40° C) up to altitude of 10,000 feet							
<b>Altitude</b>	Operation up to 10,000 feet at 40° C; up to 6,000 feet at 45° C							
<b>Storage temperature</b>	-4° to 149° F (-20° to 65° C)							
<b>Relative humidity operating and nonoperating (noncondensing)</b>	Ambient (noncondensing) operating: 5% to 90% Ambient (noncondensing) nonoperating and storage: 5% to 95%							
<b>NEBS criteria levels</b>	NEBS: <ul style="list-style-type: none"> <li>ETSI 300-019 Requirements are covered under GR-63-CORE with some deviations.</li> <li>SR-3580 NEBS level 3 (GR-63-CORE, to current issue, GR-1089-CORE, to current issue)</li> </ul>							

\* Minimum input voltage is 90VAC, and maximum input voltage is 264VAC.

## Mean-Time Between Failures (MTBF)

### Catalyst 9500X models

Table 24 lists Mean-Time Between Failures (MTBF) for the Cisco Catalyst 9500X Switch and components.

**Table 24.** MTBF information

Model	MTBF (hours)
C9500X-28C8D	123,950
C9500X-60L4D	133,260
C9K-PWR-1500WAC	1,303,300
C9K-PWR-1500WDC	1,737,740
C9500X-FAN-1U-R	4,429,340
C9500X-FAN-1U-F	4,429,340

### Catalyst 9500 models

Table 25 lists mean-time between failures (MTBF) for the Cisco Catalyst 9500 Series and components.

**Table 25.** MTBF information

Model	MTBF (hours)
C9500-32C	212,820
C9500-32QC	307,200
C9500-48Y4C	316,960
C9500-24Y4C	336,780
C9500-12Q	276,430
C9500-24Q	230,770
C9500-40X	277,310
C9500-16X	315,790
PWR-C4-950WAC-R	2,268,760
PWR-C4-950WDC-R	2,559,000
C9K-PWR-650WAC-R	2,268,760
C9K-PWR-650WACL-R	1,229,043
C9K-PWR-930WDC-R	3,008,280
C9K-PWR-1600WAC-R	1,718,780

Model	MTBF (hours)
C9K-PWR-1600WDC-R	2,559,000
FAN-T4-R	5,710,990
C9K-T1-FANTRAY	3,035,430

## Optics/transceivers modules

The link below has the matrix of supported optics/transceivers for the Cisco Catalyst 9500 Series.

For the latest Cisco Optics/transceivers modules compatibility information, refer to

<https://tmqmatrix.cisco.com/>.

## Management and standards support

Table 26 shows management and standards support for the Cisco Catalyst 9500 Series.

**Table 26.** Management and standards support

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance/9500X
<b>Management</b>	BRIDGE-MIB	BGP4-MIB
	CISCO-BRIDGE-EXT-MIB	BRIDGE-MIB
	CISCO-BULK-FILE-MIB	CISCO-ACCESS-ENVMON-MIB
	CISCO-CABLE-DIAG-MIB	CISCO-AUTH-FRAMEWORK-MIB
	CISCO-CALLHOME-MIB	CISCO-BGP4-MIB
	CISCO-CEF-MIB	CISCO-BRIDGE-EXT-MIB
	CISCO-CIRCUIT-INTERFACE-MIB	CISCO-BULK-FILE-MIB
	CISCO-DEVICE-LOCATION-MIB	CISCO-CABLE-DIAG-MIB
	CISCO-DHCP-SNOOPING-MIB	CISCO-CALLHOME-MIB
	ENTITY-VENDORTYPE-OID-MIB	CISCO-CDP-MIB
	CISCO-EIGRP-MIB	CISCO-CEF-MIB
	CISCO-EMBEDDED-EVENT-MGR-MIB	CISCO-CLASS-BASED-QOS-MIB
	CISCO-ENTITY-FRU-CONTROL-MIB	CISCO-CONFIG-COPY-MIB
	CISCO-ENTITY-SENSOR-MIB	CISCO-CONFIG-MAN-MIB
	CISCO-RTTMON-ICMP-MIB	CISCO-CONTEXT-MAPPING-MIB
	CISCO-802-TAP-MIB	CISCO-DATA-COLLECTION-MIB
	CISCO-ACCESS-ENVMON-MIB	CISCO-DHCP-SNOOPING-MIB
	CISCO-DATA-COLLECTION-MIB	CISCO-EIGRP-MIB
	CISCO-DYNAMIC-ARP-INSPECTION-MIB	CISCO-EMBEDDED-EVENT-MGR-MIB
	CISCO-ENERGYWISE-MIB	CISCO-ENHANCED-IMAGE-MIB
	CISCO-ENHANCED-IMAGE-MIB	CISCO-ENHANCED-MEMPOOL-MIB
	CISCO-ENHANCED-MEMPOOL-MIB	CISCO-ENTITY-ASSET-MIB
	CISCO-ENTITY-ASSET-MIB	CISCO-ENTITY-EXT-MIB

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance/9500X
	CISCO-ENTITY-DIAG-MIB	CISCO-ENTITY-FRU-CONTROL-MIB
	CISCO-ENTITY-EXT-MIB	CISCO-ENTITY-SENSOR-MIB
	CISCO-ENTITY-PERFORMANCE-MIB	CISCO-ENTITY-VENDORTYPE-OID-MIB
	CISCO-ENTITY-QFP-MIB	CISCO-ENVMON-MIB
	CISCO-ENVMON-MIB	CISCO-ERR-DISABLE-MIB
	CISCO-ETHER-CFM-MIB	CISCO-FLASH-MIB
	ENTITY-MIB	CISCO-FTP-CLIENT-MIB
	CISCO-ERR-DISABLE-MIB	CISCO-HSRP-EXT-MIB
	CISCO-CONFIG-COPY-MIB	CISCO-HSRP-MIB
	CISCO-FLOW-MONITOR-MIB	CISCO-IETF-BFD-MIB
	CISCO-FTP-CLIENT-MIB	CISCO-IETF-DHCP-SERVER-EXT-MIB
	CISCO-HSRP-EXT-MIB	CISCO-IETF-DHCP-SERVER-MIB
	CISCO-HSRP-MIB	CISCO-IETF-ISIS-MIB
	CISCO-IETF-BFD-MIB	CISCO-IETF-PPVPN-MPLS-VPN-MIB
	CISCO-IETF-PPVPN-MPLS-VPN-MIB	CISCO-IF-EXTENSION-MIB
	CISCO-IETF-PW-MPLS-MIB	CISCO-IGMP-FILTER-MIB
	CISCO-IF-EXTENSION-MIB	CISCO-IMAGE-LICENSE-MGMT-MIB
	CISCO-IGMP-FILTER-MIB	CISCO-IMAGE-MIB
	CISCO-IMAGE-LICENSE-MGMT-MIB	CISCO-IP-CBR-METRICS-MIB
	CISCO-IP-TAP-MIB	CISCO-IP-STAT-MIB
	CISCO-CONFIG-MAN-MIB	CISCO-IP-URPF-MIB
	CISCO-IP-CBR-METRICS-MIB	CISCO-IPMROUTE-MIB
	CISCO-IP-STAT-MIB	CISCO-IPSLA-AUTOMEASURE-MIB
	CISCO-IP-URPF-MIB	CISCO-IPSLA-ECHO-MIB
	CISCO-L2L3-INTERFACE-CONFIG-MIB	CISCO-IPSLA-JITTER-MIB
	CISCO-LAG-MIB	CISCO-L2-CONTROL-MIB
	CISCO-LICENSE-MGMT-MIB	CISCO-L2L3-INTERFACE-CONFIG-MIB
	CISCO-LOCAL-AUTH-USER-MIB	CISCO-LAG-MIB
	CISCO-MEDIA-METRICS-MIB	CISCO-LICENSE-MGMT-MIB
	CISCO-MAC-AUTH-BYPASS-MIB	CISCO-LISP-EXT-MIB
	CISCO-MAC-NOTIFICATION-MIB	CISCO-LOCAL-AUTH-USER-MIB
	CISCO-MDI-METRICS-MIB	CISCO-MAC-AUTH-BYPASS-MIB
	CISCO-FLASH-MIB	CISCO-MAC-NOTIFICATION-MIB
	CISCO-OSPF-MIB	CISCO-MEMORY-POOL-MIB
	CISCO-MEMORY-POOL-MIB	CISCO-MPLS-LSR-EXT-STD-MIB
	CISCO-MPLS-LSR-EXT-STD-MIB	CISCO-NHRP-EXT-MIB
	CISCO-NHRP-EXT-MIB	CISCO-NTP-MIB
	CISCO-NTP-MIB	CISCO-OSPF-MIB

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance/9500X
	CISCO-PAGP-MIB	CISCO-OSPF-TRAP-MIB
	CISCO-PORT-SECURITY-MIB	CISCO-PAE-MIB
	CISCO-PORT-STORM-CONTROL-MIB	CISCO-PAGP-MIB
	CISCO-POWER-ETHERNET-EXT-MIB	CISCO-PIM-MIB
	CISCO-PRIVATE-VLAN-MIB	CISCO-PING-MIB
	CISCO-PROCESS-MIB	CISCO-PKI-MIB
	CISCO-PRODUCTS-MIB	CISCO-PORT-SECURITY-MIB
	CISCO-RF-MIB	CISCO-PORT-STORM-CONTROL-MIB
	CISCO-RTP-METRICS-MIB	CISCO-PRIVATE-VLAN-MIB
	CISCO-STP-EXTENSIONS-MIB	CISCO-PROCESS-MIB
	CISCO-SYSLOG-MIB	CISCO-PRODUCTS-MIB
	CISCO-TCP-MIB	CISCO-RESILIENT-ETHERNET-PROTOCOL-MIB
	CISCO-UDLD-MIB	CISCO-RTTMON-ICMP-MIB
	CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB	CISCO-RTTMON-IP-EXT-MIB
	HC-RMON-MIB	CISCO-RTTMON-MIB
	IF-MIB	CISCO-RTTMON-RTP-MIB
	CISCO-HC-RMON-MIB	CISCO-SNMP-TARGET-EXT-MIB
	IEEE8021-LAG-MIB	CISCO-STP-EXTENSIONS-MIB
	LLDP-EXT-MED-MIB	CISCO-SYSLOG-MIB
	IP-FORWARD-MIB	CISCO-TCP-METRICS-MIB
	IP-MIB	CISCO-TCP-MIB
	HC-ALARM-MIB	CISCO-TRUSTSEC-INTERFACE-MIB
	RFC1213-MIB	CISCO-TRUSTSEC-MIB
	LLDP-MIB	CISCO-TRUSTSEC-POLICY-MIB
	MAU-MIB	CISCO-TRUSTSEC-SERVER-MIB
	MPLS-L3VPN-STD-MIB	CISCO-TRUSTSEC-SXP-MIB
	MPLS-LSR-STD-MIB	CISCO-UDLD-MIB
	MPLS-VPN-MIB	CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB
	OLD-CISCO-CHASSIS-MIB	CISCO-VLAN-MEMBERSHIP-MIB
	OLD-CISCO-CPU-MIB	CISCO-VRF-MIB
	OLD-CISCO-INTERFACES-MIB	CISCO-VTP-MIB
	OLD-CISCO-IP-MIB	ENTITY-MIB
	OLD-CISCO-SYS-MIB	ENTITY-STATE-MIB
	OLD-CISCO-TCP-MIB	EtherLike-MIB
	OLD-CISCO-TS-MIB	HC-ALARM-MIB
	OLD-CISCO-MEMORY-MIB	HC-RMON-MIB
	CISCO-POWER-ETHERNET-MIB	IEEE8021-PAE-MIB
	CISCO-RMON2-MIB	IEEE8023-LAG-MIB

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance/9500X
	CISCO-RMON-MIB	IF-MIB
	SNMPv2-MIB	IGMP-STD-MIB
	UDP-MIB	IP-FORWARD-MIB
	CISCO-IMAGE-MIB	IP-MIB
	CISCO-STACKWISE-MIB	IPMROUTE-STD-MIB
	SMON-MIB	LISP-MIB
	SONET-MIB	LLDP-EXT-MED-MIB
	TCP-MIB	LLDP-MIB
	CISCO-IPSLA-AUTOMEASURE-MIB	MAU-MIB
	CISCO-IPSLA-ECHO-MIB	MPLS-L3VPN-STD-MIB
	CISCO-IPSLA-JITTER-MIB	MPLS-LDP-GENERIC-STD-MIB
	CISCO-L2-CONTROL-MIB	MPLS-LDP-MIB
		MPLS-LSR-STD-MIB
		MPLS-VPN-MIB
		MSDP-MIB
		NHRP-MIB
		NOTIFICATION-LOG-MIB
		NTPv4-MIB
		OLD-CISCO-CHASSIS-MIB
		OLD-CISCO-CPU-MIB
		OLD-CISCO-INTERFACES-MIB
		OLD-CISCO-IP-MIB
		OLD-CISCO-MEMORY-MIB
		OLD-CISCO-SYS-MIB
		OLD-CISCO-SYSTEM-MIB
		OLD-CISCO-TCP-MIB
		OLD-CISCO-TS-MIB
		OSPF-MIB
		OSPF-TRAP-MIB
		OSPFV3-MIB
		PIM-MIB
		RFC1213-MIB
		RMON-MIB
		RMON2-MIB
		SNMP-COMMUNITY-MIB
		SNMP-FRAMEWORK-MIB
		SNMP-MPD-MIB
		SNMP-NOTIFICATION-MIB

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance/9500X
		SNMP-PROXY-MIB SNMP-TARGET-MIB SNMP-USM-MIB SNMP-VIEW-BASED-ACM-MIB SNMPv2-MIB TCP-MIB UDP-MIB CISCO-802-TAP-MIB CISCO-TAP2-MIB CISCO-IP-TAP-MIB
<b>Standards</b>	IEEE 802.1s IEEE 802.1w IEEE 802.1x IEEE 802.3ae for 10G SKU IEEE 802.3ae, IEEE 802.3ba on the 40G SKU IEEE 802.1x-Rev IEEE 802.3ad IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports IEEE 802.1D Spanning Tree Protocol IEEE 802.1p Class-of-Service (CoS) prioritization IEEE 802.1Q VLAN IEEE 802.3 10BASE-T specification IEEE 802.3u 100BASE-TX specification IEEE 802.3ab 1000BASE-T specification IEEE 802.3z 1000BASE-X specification RMON I and II standards SNMPv1, SNMPv2c, and SNMPv3	

## Safety and compliance

Table 27 lists the safety and compliance information for the Cisco Catalyst 9500 Series.

**Table 27.** Safety and compliance information

Description	Specification
<b>Safety certifications</b>	<p>C9500-12Q, C9500-24Q, C9500-40X, C9500-16X</p> <ul style="list-style-type: none"> <li>• UL 60950-1</li> <li>• CAN/CSA-C22.2 No. 60950-1</li> <li>• EN 60950-1</li> <li>• IEC 60950-1</li> <li>• AS/NZS 60950-1</li> <li>• GB4943</li> </ul> <p>C9500-32C, C9500-32QC, C9500-24Y4C, C9500-48Y4C</p> <ul style="list-style-type: none"> <li>• IEC 60950-1 plus Am1, Am2 Am9, Am10, Am11, Am12 and all deviations and differences</li> <li>• AS/NZS 60950.1.2011</li> <li>• CAN/CSA-C22.2 No. 60950-1-07</li> <li>• GB 4943-95</li> <li>• EN 60950-1; 2006 plus Am1, Am 2, Am9, Am10, Am11, Am12 and all deviations and differences</li> <li>• NOM-019-SCFI-1998</li> <li>• UL 60950-1, Second Edition</li> </ul> <p>C9500X-28C8D, C9500X-60L4D</p> <ul style="list-style-type: none"> <li>• UL 60950-1</li> <li>• CAN/CSA-C22.2 No. 60950-1</li> <li>• IEC 60950-1</li> <li>• AS/NZS 60950-1</li> <li>• EN 62368-1</li> <li>• UL 62368-1</li> <li>• CAN/CSA-C22.2 No. 62368-1</li> <li>• IEC 62368-1</li> <li>• AS/NZS 62368-1</li> </ul>
<b>EMI and EMC compliance</b>	<p>C9500 Models</p> <ul style="list-style-type: none"> <li>• 47 CFR Part 15 Class A</li> <li>• CNS13438: 2006 Class A</li> <li>• EN 300 386 V1.6.1</li> <li>• EN61000-3-2: 2014</li> <li>• EN61000-3-3: 2013</li> <li>• ICES-003 Issue 6: 2016 Class A</li> <li>• KN 32: 2015 Class A</li> <li>• TCVN 7189: 2009 Class A</li> <li>• EN 55032:2012/ AC:2013 Class A</li> <li>• EN 55032:2015 Class A</li> <li>• CISPR 32 Edition 2 Class A</li> <li>• V-2/2015.04 Class A</li> <li>• V-3/2015.04 Class A</li> </ul>



Description	Specification
	<ul style="list-style-type: none"> <li>• CISPR24: 2010 + A1: 2015</li> <li>• EN 300 386 V1.6.1</li> <li>• EN55024: 2010 + A1: 2015</li> <li>• KN35: 2015</li> <li>• TCVN 7317: 2003</li> </ul> <p>C9500X Models</p> <ul style="list-style-type: none"> <li>• CNS13438: 2006 Class A</li> <li>• EN 300 386 V1.6.1</li> <li>• EN61000-3-2: 2014</li> <li>• EN61000-3-3: 2013</li> <li>• ICES-003 Issue 6: 2016 Class A</li> <li>• KS C 9832:2019</li> <li>• CISPR32:2015:Ed:2</li> <li>• EN 55032:2012/ AC:2013 Class A</li> <li>• EN 55032:2015 Class A</li> <li>• CISPR 32 Edition 2 Class A</li> <li>• VCCI/CISPR 32 2016</li> <li>• CISPR24: 2010 + A1: 2015</li> <li>• EN 300 386 V1.6.1</li> <li>• EN55024: 2010 + A1: 2015</li> <li>• KS C 9835:2019</li> <li>• EN 55035:2017+A11:2020</li> <li>• 47 CFR Part 15:2016</li> </ul>

## Warranty

### Cisco Enhanced Limited Lifetime Hardware Warranty

The Cisco Catalyst 9500 Series Switches come with an Enhanced Limited Lifetime Warranty (E-LLW) that includes Next-Business-Day (NBD) delivery of replacement hardware where available and 90 days of 8x5 Cisco Technical Assistance Center (TAC) support. Your formal warranty statement, including the warranty applicable to Cisco software, appears in the information packet that accompanies your Cisco product. We encourage you to carefully review the warranty statement shipped with your specific product before use. Cisco reserves the right to refund the purchase price as its exclusive warranty remedy. For further information about warranty terms, visit <https://www.cisco.com/go/warranty>.

Table 28 provides information about the E-LLW.

**Table 28.** E-LLW details

	Cisco E-LLW
<b>Devices covered</b>	Applies to Cisco Catalyst 9500 Series Switches.
<b>Warranty duration</b>	As long as the original customer owns the product.
<b>End-of-life policy</b>	In the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.

	Cisco E-LLW
<b>Hardware replacement</b>	Cisco or its service center will use commercially reasonable efforts to ship a replacement for NBD delivery, where available. Otherwise, a replacement will be shipped within 10 working days after receipt of the Return Materials Authorization (RMA) request. Actual delivery times might vary depending on customer location.
<b>Effective date</b>	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than 90 days after original shipment by Cisco).
<b>TAC support</b>	Cisco will provide during business hours, 8 hours per day, 5 days per week, basic configuration, diagnosis, and troubleshooting of device-level problems for up to a 90-day period from the date of shipment of the originally purchased Cisco Catalyst 9500 Series product. This support does not include solution or network-level support beyond the specific device under consideration.
<b>Cisco.com access</b>	Warranty allows guest access only to Cisco.com.

## Cisco environmental sustainability

Information about Cisco’s environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the “Environment Sustainability” section of Cisco’s [Corporate Social Responsibility](#) (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the “Environment Sustainability” section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
<b>Information on product material content laws and regulations</b>	<a href="#">Materials</a>
<b>Information on electronic waste laws and regulations, including products, batteries, and packaging</b>	<a href="#">WEEE compliance</a>

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

## Cisco and Partner Services

Cisco and Partner Services offer various personalized services to enable IoT, cloud and secure networks. You can purchase advanced services designed to meet your business needs and help you maintain high-quality network performance while controlling operational costs. Please refer to Table 29 for more information on Cisco’s Technical Services available for the Cisco Catalyst 9500 Series Switches.

**Table 29.** Technical Services

Cisco Technical Services
<p><b>Cisco Smart Net Total Care Service</b></p> <ul style="list-style-type: none"> <li>• Around-the-clock, global access to the Cisco TAC</li> <li>• Unrestricted access to the extensive Cisco.com knowledge base and tools</li> <li>• NBD, 8x5x4, 24x7x4, and 24x7x2 advance hardware replacement and onsite parts replacement and installation available</li> <li>• Ongoing operating system software updates within the licensed feature set<sup>1</sup></li> </ul>

## Cisco Technical Services

- Proactive diagnostics and real-time alerts on Smart Call Home-enabled devices

### Cisco Smart Foundation Service

- NBD advance hardware replacement as available
- Access during business hours to Small and Medium-sized Business (SMB) TAC (access levels vary by region)
- Access to Cisco.com SMB knowledge base
- Online technical resources through Smart Foundation portal
- Operating system software bug fixes and patches

### Cisco SP Base Service

- Around-the-clock, global access to the Cisco TAC
- Registered access to Cisco.com
- NBD, 8x5x4, 24x7x4, and 24x7x2 advance hardware replacement; return to factory option available<sup>2</sup>
- Ongoing operating system software updates<sup>1</sup>

### Cisco Focused Technical Support Services

- Three levels of premium, high-touch services are available:
  - Cisco High-Touch Operations Management Service
  - Cisco High-Touch Technical Support Service
  - Cisco High-Touch Engineering Service
- Valid Cisco Smart Net Total Care or SP Base contracts are required on all network equipment

<sup>1</sup> Cisco operating system updates include the following: maintenance releases, minor updates, and major updates within the licensed feature set.

<sup>2</sup> Advance hardware replacement is available in various service-level combinations. For example, 8x5xNBD indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with NBD delivery. Where NBD is not available, same-day shipping is provided. Restrictions apply. For details, review the appropriate service descriptions.

[Learn more about available services.](#)

## Ordering information

To place an order, visit the Cisco Ordering home page at:

[https://www.cisco.com/en/US/ordering/or13/or8/order\\_customer\\_help\\_how\\_to\\_order\\_listing.html](https://www.cisco.com/en/US/ordering/or13/or8/order_customer_help_how_to_order_listing.html).

Table 30 lists ordering information for the Cisco Catalyst 9500 Series.

**Table 30.** Ordering information

Product number	Product description
<b>C9500X-28C8D-A</b>	Catalyst 9500 28x100G + 8x400G switch, NW Advantage License
<b>C9500X-28C8D-E</b>	Catalyst 9500 28x100G + 8x400G switch, NW Essentials License
<b>C9500X-60L4D-A</b>	Catalyst 9500 60x50G + 4x400G switch, NW Advantage License
<b>C9500-32C-E</b>	Cisco Catalyst 9500 Series high performance 32-port 100G switch, NW Ess. License
<b>C9500-32C-A</b>	Cisco Catalyst 9500 Series high performance 32-port 100G switch, NW Adv. License

Product number	Product description
<b>C9500-32QC-E</b>	Cisco Catalyst 9500 Series high performance 32-port 40G switch, NW Ess. License
<b>C9500-32QC-A</b>	Cisco Catalyst 9500 Series high performance 32-port 40G switch, NW Adv. License
<b>C9500-48Y4C-E</b>	Cisco Catalyst 9500 Series high performance 48-port 25G switch, NW Ess. License
<b>C9500-48Y4C-A</b>	Cisco Catalyst 9500 Series high performance 48-port 25G switch, NW Adv. License
<b>C9500-24Y4C-E</b>	Cisco Catalyst 9500 Series high performance 24-port 1/10/25G switch, NW Ess. License
<b>C9500-24Y4C-A</b>	Cisco Catalyst 9500 Series high performance 24-port 1/10/25G switch, NW Adv. License
<b>C9500-24Q-E</b>	Cisco Catalyst 9500 24-port 40G switch, NW Ess. License
<b>C9500-24Q-A</b>	Cisco Catalyst 9500 24-port 40G switch, NW Adv. License
<b>C9500-12Q-E</b>	Cisco Catalyst 9500 12-port 40G switch, NW Ess. License
<b>C9500-12Q-A</b>	Cisco Catalyst 9500 12-port 40G switch, NW Adv. License
<b>C9500-40X-E</b>	Cisco Catalyst 9500 40-port 10G switch, NW Ess. License
<b>C9500-40X-A</b>	Cisco Catalyst 9500 40-port 10G switch, NW Adv. License
<b>C9500-16X-E</b>	Cisco Catalyst 9500 16-port 10G switch, NW Ess. License
<b>C9500-16X-A</b>	Cisco Catalyst 9500 16-port 10G switch, NW Adv. License
<b>C9500-48X-A</b>	Cisco Catalyst 9500 40-port 10G switch, 8 x 10GE Network Module, NW Adv. License
<b>C9500-48X-E</b>	Cisco Catalyst 9500 40-port 10G switch, 8 x 10GE Network Module, NW Ess. License
<b>C9500-24X-A</b>	Cisco Catalyst 9500 16-port 10G switch, 8 x 10GE Network Module, NW Adv. License
<b>C9500-24X-E</b>	Cisco Catalyst 9500 16-port 10G switch, 8 x 10GE Network Module, NW Ess. License
<b>C9500-16X-2Q-A</b>	Cisco Catalyst 9500 16-port 10G switch, 2 x 40GE Network Module, NW Adv. License
<b>C9500-16X-2Q-E</b>	Cisco Catalyst 9500 16-port 10G switch, 2 x 40GE Network Module, NW Ess. License
<b>C9500-40X-2Q-A</b>	Cisco Catalyst 9500 40-port 10G switch, 2 x 40GE Network Module, NW Adv. License
<b>C9500-40X-2Q-E</b>	Cisco Catalyst 9500 40-port 10G switch, 2 x 40GE Network Module, NW Ess. License
<b>Network modules</b>	
<b>C9500-NM-2Q</b>	Cisco Catalyst 9500 2 x 40GE Network Module
<b>C9500-NM-8X</b>	Cisco Catalyst 9500 8 x 10GE Network Module
<b>C9500-NM-2Q=</b>	Cisco Catalyst 9500 2 x 40GE Network Module Spare
<b>C9500-NM-8X=</b>	Cisco Catalyst 9500 8 x 10GE Network Module Spare

Product number	Product description
<b>Software Licenses for Catalyst 9500</b>	
<b>Cisco DNA Software Licenses</b>	
<b>C9500X-DNA-E-3Y</b>	Catalyst 9500X Cisco DNA Essential license (3Y) for 28C8D SKU
<b>C9500X-DNA-E-5Y</b>	Catalyst 9500X Cisco DNA Essential license (5Y) for 28C8D SKU
<b>C9500X-DNA-E-7Y</b>	Catalyst 9500X Cisco DNA Essential license (7Y) for 28C8D SKU
<b>C9500X-DNA-A-3Y</b>	Catalyst 9500X Cisco DNA Advantage license (3Y) for 28C8D, 60L4D SKU
<b>C9500X-DNA-A-5Y</b>	Catalyst 9500X Cisco DNA Advantage license (5Y) for 28C8D, 60L4D SKU
<b>C9500X-DNA-A-7Y</b>	Catalyst 9500X Cisco DNA Advantage license (7Y) for 28C8D, 60L4D SKU
<b>C9500-DNA-E-3Y</b>	Catalyst 9500 NW and Cisco DNA Essentials. license (3Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
<b>C9500-DNA-E-5Y</b>	Catalyst 9500 NW and Cisco DNA Essentials. license (5Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
<b>C9500-DNA-E-7Y</b>	Catalyst 9500 NW and Cisco DNA Essentials. license (7Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
<b>C9500-DNA-A-3Y</b>	Catalyst 9500 NW and Cisco DNA Advantage license (3Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
<b>C9500-DNA-A-5Y</b>	Catalyst 9500 NW and Cisco DNA Advantage license (5Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
<b>C9500-DNA-A-7Y</b>	Catalyst 9500 NW and Cisco DNA Advantage license (7Y)
<b>C9500-DNA-L-E-3Y</b>	Catalyst 9500 NW and Cisco DNA Essentials. low port density license (3Y) for 12Q, 16X, 24Y4C SKU
<b>C9500-DNA-L-E-5Y</b>	Catalyst 9500 NW and Cisco DNA Essentials. low port density license (5Y) for 12Q, 16X, 24Y4C SKU
<b>C9500-DNA-L-E-7Y</b>	Catalyst 9500 NW and Cisco DNA Essentials. low port density license (7Y) for 12Q, 16X, 24Y4C SKU
<b>C9500-DNA-L-A-3Y</b>	Catalyst 9500 NW and Cisco DNA Advantage low port density license (3Y) for 12Q, 16X, 24Y4C SKU
<b>C9500-DNA-L-A-5Y</b>	Catalyst 9500 NW and Cisco DNA Advantage low port density license (5Y) for 12Q, 16X, 24Y4C SKU
<b>C9500-DNA-L-A-7Y</b>	Catalyst 9500 NW and Cisco DNA Advantage low port density license (7Y) for 12Q, 16X, 24Y4C SKU
<b>C9500-LIC=</b>	Cisco DNA software license upgrade from Essentials to Advantage
<b>Cisco Catalyst Software Licenses</b>	

Product number	Product description
<b>C9500-DNX-E-12Q-3Y</b>	C9500 12-Port 40G QSFP+, 3 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-12Q-5Y</b>	C9500 12-Port 40G QSFP+, 5 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-12Q-7Y</b>	C9500 12-Port 40G QSFP+, 7 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-A-12Q-3Y</b>	C9500 12-Port 40G QSFP+, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-12Q-5Y</b>	C9500 12-Port 40G QSFP+, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-12Q-7Y</b>	C9500 12-Port 40G QSFP+, 7 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-E-16X-3Y</b>	C9500 16-Port 10G SFP+, 3 Year term Cisco Catalyst Essentials software subscription license (includes C9500-24X-E SKU)
<b>C9500-DNX-E-16X-5Y</b>	C9500 16-Port 10G SFP+, 5 Year term Cisco Catalyst Essentials software subscription license (includes C9500-24X-E SKU)
<b>C9500-DNX-E-16X-7Y</b>	C9500 16-Port 10G SFP+, 7 Year term Cisco Catalyst Essentials software subscription license (includes C9500-24X-E SKU)
<b>C9500-DNX-A-16X-3Y</b>	C9500 16-Port 10G SFP+, 3 Year term Cisco Catalyst Advantage software subscription license (includes C9500-24X-A SKU)
<b>C9500-DNX-A-16X-5Y</b>	C9500 16-Port 10G SFP+, 5 Year term Cisco Catalyst Advantage software subscription license (includes C9500-24X-A SKU)
<b>C9500-DNX-A-16X-7Y</b>	C9500 16-Port 10G SFP+, 7 Year term Cisco Catalyst Advantage software subscription license (includes C9500-24X-A SKU)
<b>C9500-DNX-E-24Q-3Y</b>	C9500 24-Port 40G QSFP+, 3 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-24Q-5Y</b>	C9500 24-Port 40G QSFP+, 5 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-24Q-7Y</b>	C9500 24-Port 40G QSFP+, 7 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-A-24Q-3Y</b>	C9500 24-Port 40G QSFP+, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-24Q-5Y</b>	C9500 24-Port 40G QSFP+, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-24Q-7Y</b>	C9500 24-Port 40G QSFP+, 7 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-E-24Y-3Y</b>	C9500 24-Port 25G SFP28, 3 Year term Cisco Catalyst Essentials software subscription license

Product number	Product description
<b>C9500-DNX-E-24Y-5Y</b>	C9500 24-Port 25G SFP28, 5 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-24Y-7Y</b>	C9500 24-Port 25G SFP28, 7 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-A-24Y-3Y</b>	C9500 24-Port 25G SFP28, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-24Y-5Y</b>	C9500 24-Port 25G SFP28, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-24Y-7Y</b>	C9500 24-Port 25G SFP28, 7 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-E-28C-3Y</b>	C9500 28-Port 100G QSFP28, 8-port 400G QSFP-DD, 3 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-28C-5Y</b>	C9500 28-Port 100G QSFP28, 8-port 400G QSFP-DD, 5 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-28C-7Y</b>	C9500 28-Port 100G QSFP28, 8-port 400G QSFP-DD, 7 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-A-28C-3Y</b>	C9500 28-Port 100G QSFP28, 8-port 400G QSFP-DD, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-28C-5Y</b>	C9500 28-Port 100G QSFP28, 8-port 400G QSFP-DD, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-28C-7Y</b>	C9500 28-Port 100G QSFP28, 8-port 400G QSFP-DD, 7 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-E-32C-3Y</b>	C9500 32-Port 100G QSFP28, 3 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-32C-5Y</b>	C9500 32-Port 100G QSFP28, 5 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-32C-7Y</b>	C9500 32-Port 100G QSFP28, 7 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-A-32C-3Y</b>	C9500 32-Port 100G QSFP28, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-32C-5Y</b>	C9500 32-Port 100G QSFP28, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-32C-7Y</b>	C9500 32-Port 100G QSFP28, 7 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-E-32Q-3Y</b>	C9500 32-Port 40G QSFP+, 3 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-32Q-5Y</b>	C9500 32-Port 40G QSFP+, 5 Year term Cisco Catalyst Essentials software subscription license



Product number	Product description
<b>C9500-DNX-E-32Q-7Y</b>	C9500 32-Port 40G QSFP+, 7 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-A-32Q-3Y</b>	C9500 32-Port 40G QSFP+, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-32Q-5Y</b>	C9500 32-Port 40G QSFP+, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-32Q-7Y</b>	C9500 32-Port 40G QSFP+, 7 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-E-40X-3Y</b>	C9500 40-Port 10G SFP+, 3 Year term Cisco Catalyst Essentials software subscription license (includes C9500-48X-E SKU)
<b>C9500-DNX-E-40X-5Y</b>	C9500 40-Port 10G SFP+, 5 Year term Cisco Catalyst Essentials software subscription license (includes C9500-48X-E SKU)
<b>C9500-DNX-E-40X-7Y</b>	C9500 40-Port 10G SFP+, 7 Year term Cisco Catalyst Essentials software subscription license (includes C9500-48X-E SKU)
<b>C9500-DNX-A-40X-3Y</b>	C9500 40-Port 10G SFP+, 3 Year term Cisco Catalyst Advantage software subscription license (includes C9500-48X-A SKU)
<b>C9500-DNX-A-40X-5Y</b>	C9500 40-Port 10G SFP+, 5 Year term Cisco Catalyst Advantage software subscription license (includes C9500-48X-A SKU)
<b>C9500-DNX-A-40X-7Y</b>	C9500 40-Port 10G SFP+, 7 Year term Cisco Catalyst Advantage software subscription license (includes C9500-48X-A SKU)
<b>C9500-DNX-E-48Y-3Y</b>	C9500 48-Port 25G SFP28, 3 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-48Y-5Y</b>	C9500 48-Port 25G SFP28, 5 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-E-48Y-7Y</b>	C9500 48-Port 25G SFP28, 7 Year term Cisco Catalyst Essentials software subscription license
<b>C9500-DNX-A-48Y-3Y</b>	C9500 48-Port 25G SFP28, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-48Y-5Y</b>	C9500 48-Port 25G SFP28, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-48Y-7Y</b>	C9500 48-Port 25G SFP28, 7 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-60L-3Y</b>	C9500 60-Port 50G SFP56, 3 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-60L-5Y</b>	C9500 60-Port 50G SFP56, 5 Year term Cisco Catalyst Advantage software subscription license
<b>C9500-DNX-A-60L-7Y</b>	C9500 60-Port 50G SFP56, 7 Year term Cisco Catalyst Advantage software subscription license



Product number	Product description
<b>Power supplies, cables, and fan for the Cisco Catalyst 9500 Series</b>	
<b>C9K-PWR-1600WAC-R</b>	1600W AC Power Supply
<b>C9K-PWR-650WAC-R</b>	650W AC Power Supply
<b>C9K-PWR-650WACL-R</b>	650W AC Power Supply
<b>C9K-PWR-1600WDC-R</b>	1600W DC Power Supply
<b>C9K-PWR-930WDC-R</b>	930W DC Power Supply
<b>C9K-PWR-1600WACR/2</b>	1600W AC Power Supply, Redundant
<b>C9K-PWR-650WAC-R/2</b>	650W AC Power Supply, Redundant
<b>C9K-PWR-650WACL/2</b>	650W AC Power Supply, Redundant
<b>C9K-PWR-1600WDCR/2</b>	1600W DC Power Supply, Redundant
<b>C9K-PWR-930WDC-R/2</b>	930W DC Power Supply, Redundant
<b>C9K-PWR-C4-BLANK</b>	Catalyst 9500 power supply blank cover
<b>C9K-PWR-C5-BLANK</b>	Catalyst 9500 power supply blank cover
<b>C9K-T1-FANTRAY</b>	Catalyst 9500 fan tray
<b>FAN-T4-R</b>	Catalyst 9500 Type 4 front to back cooling Fan
<b>PWR-C4-950WAC-R</b>	950W AC Config 4 Power Supply front to back cooling
<b>PWR-C4-950WAC-R/2</b>	950W AC Config 4 Power Supply front to back cooling, Redundant
<b>PWR-C4-BLANK</b>	Catalyst 9500 power supply blank cover
<b>CAB-C15-CBN-JP</b>	Japan Cabinet Jumper Power Cord, 250 VAC 12A, C14-C15
<b>CAB-TA-250V-JP</b>	Japan 250V AC Type A Power Cable
<b>CAB-TA-AP</b>	Australia AC Type A Power Cable
<b>CAB-TA-AR</b>	Argentina AC Type A Power Cable
<b>CAB-TA-DN</b>	Denmark AC Type A Power Cable
<b>CAB-TA-EU</b>	Europe AC Type A Power Cable
<b>CAB-TA-IN</b>	India AC Type A Power Cable
<b>CAB-TA-IS</b>	Israel AC Type A Power Cable
<b>CAB-TA-IT</b>	Italy AC Type A Power Cable

Product number	Product description
<b>CAB-TA-SW</b>	Switzerland AC Type A Power Cable
<b>CAB-TA-UK</b>	United Kingdom AC Type A Power Cable
<b>CAB-TA-NA</b>	North America AC Type A Power Cable
<b>CAB-C15-CBN</b>	Cabinet Jumper Power Cord, 250 VAC 13A, C14-C15 Connectors
<b>CAB-TA-JP</b>	Japan AC Type A Power Cable
<b>Spare accessory and rack mount kits for the Cisco Catalyst 9500 Series</b>	
<b>C9500-ACCKITH-19I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - High-End - 19" rack mount
<b>C9500-ACCKITH-23I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - High-End - 23" rack mount
<b>C9500-4PTH-KIT=</b>	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series - High-End
<b>C9500-ACC-KIT-19I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - 19" rack mount
<b>C9500-ACC-KIT-23I=</b>	Accessory Kit for Cisco Catalyst 9500 Series - 23" rack mount
<b>C9500-4PT-KIT=</b>	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series
<b>Power supplies, cables, and fan for the Cisco Catalyst 9500X Switch</b>	
<b>C9K-PWR-1500WAC</b>	Catalyst 9500X 1500W AC Power Supply
<b>C9K-PWR-1500WDC</b>	Catalyst 9500X 1500W DC Power Supply
<b>C9K-PWR-1500WAC/2</b>	Catalyst 9500X 1500W AC Power Supply, Redundant
<b>C9K-PWR-1500WDC/2</b>	Catalyst 9500X 1500W DC Power Supply, Redundant
<b>PWR-C6-BLANK</b>	Catalyst 9500X power supply blank cover
<b>C9500X-FAN-1U-R</b>	Catalyst 9500X front to back cooling fan
<b>C9500X-FAN-1U-F</b>	Catalyst 9500X back to front cooling fan
<b>NO-POWER-CORD</b>	ECO friendly green option, no power cable will be shipped
<b>PWR-CAB-AC-USA520</b>	US AC Power Cord for Cisco ASR 900, NEMA 5-20
<b>PWR-CAB-AC-USA</b>	Power Cord for AC V2 Power Module (USA), NEMA L6-20P
<b>PWR-CAB-AC-AUS</b>	Power Cord for AC V2 Power Module (Australia), AS 3112
<b>PWR-CAB-AC-EU</b>	Power Cord for AC V2 Power Module (Europe), CEE 7/7
<b>PWR-CAB-AC-ITA</b>	Power Cord for AC V2 Power Module (Italy), CEI-23-50
<b>PWR-CAB-AC-SA</b>	Power Cord for AC V2 Power Module (South Africa), SABS 164

Product number	Product description
<b>PWR-CAB-AC-UK</b>	Power Cord for AC V2 Power Module (UK), EN 60309-2
<b>PWR-CAB-AC-ISRL</b>	Power Cord for AC V2 Power Module (Israel), SI 32
<b>PWR-CAB-AC-CHN</b>	Power Cord for AC V2 Power Module (China), GB2099.1/GB1002
<b>PWR-CAB-AC-BRA</b>	Power Cord for AC V2 Power Module (Brazil), NBR 14136
<b>PWR-CAB-AC-SUI</b>	Power Cord for AC V2 Power Module (Swiss), SEV 1011
<b>PWR-CAB-AC-JPN</b>	Power Cord for AC V2 Power Module (Japan), JIS C8303
<b>PWR-CAB-AC-IND</b>	India AC Power Cord for Cisco ASR 900, IS:1293
<b>PWR-CAB-AC-ARG</b>	AC POWER CORD, WIRE HARNESS, Argentina, IRAM 2073, IEC60320 C21, ST, 4M, 30 AWG, STRANDED, 250.0 V, 16.0 A
<b>PWR-2KW-DC-CBL</b>	Power Cord - 2KW DC
<b>Spare accessory and rack mount kits for the Cisco Catalyst 9500X Switch</b>	
<b>C9500X-ACCKIT-19I=</b>	Accessory Kit for Cisco Catalyst 9500X Switch - 19" rack mount
<b>C9500X-ACCKIT-23I=</b>	Accessory Kit for Cisco Catalyst 9500X Switch - 23" rack mount
<b>C9500X-4PTH-KIT=</b>	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500X Switch
<b>Spare storage options for the Cisco Catalyst 9500X Switch</b>	
<b>C9K-F3-SSD-240GB=</b>	Cisco pluggable SSD storage - 240 GB
<b>C9K-F3-SSD-480GB=</b>	Cisco pluggable SSD storage - 480 GB
<b>C9K-F3-SSD-960GB=</b>	Cisco pluggable SSD storage - 960 GB
<b>RFID opt in / opt out for C9500 high performance and C9500X switches</b>	
<b>C9500-RFID</b>	RFID Selected for C9500 high performance switches (C9500-24Y4C, C9500-48Y4C, C9500-32C, C9500-32QC)
<b>C9500X-RFID</b>	RFID Selected for C9500X switches
<b>C9500-RFID-NONE</b>	No RFID Selected for C9500 high performance and C9500X switches

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## Document history

New or revised topic	Described In	Date
<b>Added Simplified Campus Automation</b>	All relevant sections	June 4, 2024
<b>Added Cisco Catalyst software subscription details and SKUs, updated Cisco Catalyst Center naming</b>	All relevant sections	September 10, 2023
<b>Updated with IOS XE 17.10.1 contents</b>	Entire Document	March 1, 2023
<b>Added Catalyst 9500X-60L4D and updated relevant sections</b>	Entire Document	November 28, 2022
<b>Added new 650W AC power supply</b>	<a href="#">Page 18</a> , <a href="#">19</a> , <a href="#">33</a> , <a href="#">47</a>	September 21, 2022
<b>Added Meraki Cloud monitoring</b>	Removed Cisco DNA Premier licenses	September 21, 2022
<b>Added Catalyst 9500X-28C8D and Silicon One Q200 details, and updated all sections</b>	Entire document	January 31, 2022
<b>Added Custom ASIC template, eWLC without SD-Access, EVPN, MPLS, Programmability, removed ETA and AVC, updated Operating temperature</b>	<a href="#">Product Overview</a> , <a href="#">Platform Details</a> , <a href="#">Specifications</a>	September 28, 2020
<b>Added NEBS Certification details, 16.11.1 features, VLAN ID correction, SDM template corrections, SVL</b>	<a href="#">Page 13</a> , <a href="#">14</a> , <a href="#">15</a> , <a href="#">22</a> , <a href="#">23</a> , <a href="#">24</a>	April 16, 2019
<b>Cisco Catalyst 9500 Series spec change</b>	Updated <a href="#">Page 3</a>	January 11, 2019
<b>Product highlights changes (switching capacity and ports spec changes)</b>	Updated <a href="#">Page 4</a>	January 11, 2019
<b>Cisco Catalyst 9500 Series configurations and port density spec changes</b>	Updated <a href="#">Page 12</a>	January 11, 2019
<b>Performance spec changes</b>	Updated <a href="#">Page 13</a>	January 11, 2019
<b>Text changes to “Important Note”</b>	Updated <a href="#">Page 21</a>	January 11, 2019
<b>Text changes to “Cisco StackWise Virtual”</b>	Updated <a href="#">Page 16</a>	January 11, 2019
<b>Text changes to “Trustworthy systems” and “Cisco StackWise Virtual”</b>	Updated <a href="#">Page 18</a>	January 11, 2019
<b>Added text for Layer 3 Subinterface and BGP EVPN with VXLAN</b>	Updated <a href="#">Page 20</a>	January 11, 2019
<b>Deleted text for “High-performance IP routing” and spec edits to “Minimum software requirements”</b>	Updated <a href="#">Page 22</a>	January 11, 2019
<b>Text changes to “Licensing” and spec edits to “Network Essentials and Advantage Package Features”</b>	Updated <a href="#">Page 23</a>	January 11, 2019
<b>Text changes to “Cisco DNA Essentials and Advantage Package Features”</b>	Updated <a href="#">Page 24</a>	January 11, 2019
<b>Added product numbers for “Cisco Catalyst 9500 Series”</b>	Updated <a href="#">Page 33</a>	January 11, 2019

New or revised topic	Described In	Date
<b>Deleted product numbers for “Cisco Catalyst 9500 Series”</b>	Updated <a href="#">Page 34</a>	January 11, 2019
<b>Product highlights changes (switching capacity and ports spec changes)</b>	Updated <a href="#">Page 4</a>	January 11, 2019
<b>Updates to Table 1</b>	Updated <a href="#">Table 1</a>	August 15, 2018
<b>Added clearer description of SKUs, Updated date for Tables 1, 10, 11</b>	Updated SKU descriptions, <a href="#">Table 11 data</a> , <a href="#">Table 10 data</a> , <a href="#">Table 1 Footnotes</a>	July 3, 2018
<b>Added clearer descriptions of host routes and scale adjacency in hardware</b>	Updated <a href="#">Table 10 Footnotes</a>	June 1, 2018
<b>Added Catalyst 9500 high density platforms and updated associated speeds and densities, e.g. Up to 6.4-Tbps switching capacity with up to 2 Bpps of forwarding performance from “3.2 Tbps/1 Bpps” a. 32 port 100G, b. 32 port 40G, c. 48 port 25G. Added Catalyst 9500 mid density platform a. 24 port 25G, b. 16 port 1/10G. Added new optical interfaces - QSFP28, SFP28. Added new power supply options - 650W, 1600W. Added RESCONF support. StackWise Virtual extended to all Catalyst 9500 platforms.</b>	Updated <a href="#">Product Overview</a>	March 31, 2018
<b>AVB support noted for certain platforms. Corrected references to Catalyst 9000 switches, rather than Catalyst 9000 Series switches. Corrected references to Cisco IOS XE, rather than IOS-XE.</b>	Updated <a href="#">Audio Video Bridging</a>	December 15, 2017

Americas Headquarters  
Cisco Systems, Inc.  
San Jose, CA

Asia Pacific Headquarters  
Cisco Systems (USA) Pte. Ltd.  
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